VOLUME XXXIX Established 1914 Number 5

CHEMICAL INDUSTRIES

NOVEMBER, 1936

CHEMICAL INDUSTRIES is published monthly by The Haynes & George Co., Inc. WILLIAMS HAYNES, *President*; W. F. GEORGE, *Vice-President*; D. O. HAYNES, *Secretary*; J. H. BURT, *Treasurer*.

Published on the tenth day of each month at New Haven, Conn., and printed for the publishers by The Tuttle, Morehouse & Taylor Company.

Entered as second class matter, December 22, 1934, at the Post Office at New Haven, Conn., under the act of March 3, 1879.

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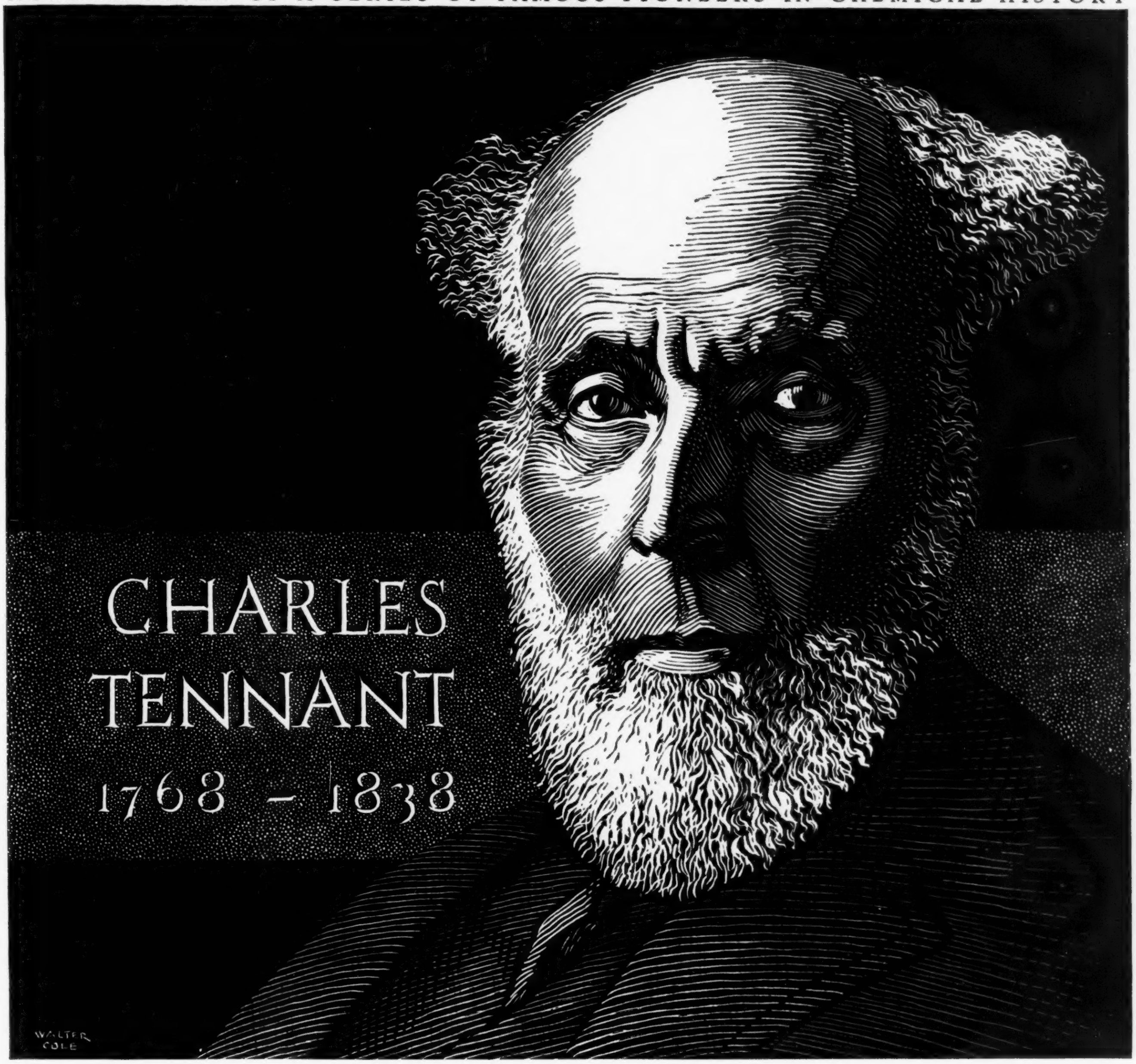
PUBLICATION AND EDITORIAL OFFICES, NEW HAVEN, CONN. ADVERTISING SALES OFFICE, 25 SPRUCE ST., NEW YORK, N. Y.

NUMBER SEVEN OF A SERIES OF FAMOUS PIONEERS IN CHEMICAL HISTORY



TEXTILE bleaching was shortened from a matter of months to a matter of hours when Charles Tennant, an "eminent practical chemist" of Glasgow, produced the first bleaching powder by saturating lime with chlorine. Others had recognized the possibilities offered by the decolorizing action of chlorine upon fabrics, but Tennant made chlorine available in commercial quantities in a form that could be transported and readily applied. In the United States, the earliest production of bleaching powder was in 1895, when Mathieson placed the first domestic product on the market. Since this early pioneering venture, Mathieson has been in the forefront of new developments in the production and distribution of chlorine and chlorine products and in the efficient application of these products in textile bleaching, in paper and pulp bleaching, in petroleum refining, in water purification and in other important fields.

The MATHIESON ALKALI WORKS (*Inc.*), 60 East 42nd St., New York, N. Y.

In its Annual Proceedings of 1839, the Institution of Civil Engineers, London, said of Charles Tennant: "The great revolution in the practice of bleaching... was carried out by the discoveries made by him, first of the Solution of Chloride of Lime and afterwards of the dry Chloride of Lime, or bleaching powder—an inestimable gift to the arts with which the name of Mr. Tennant will always be associated. He... will long continue to be extensively known and associated with practical science."

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH AND HTH-15 . . .

Mathieson Chemicals

AMMONIA, ANHYDROUS AND AQUA . . . PH-PLUS (FUSED ALKALI) . . . SOLID CARBON DIOXIDE . . . CCH (INDUSTRIAL HYPOCHLORITE)

The Reader Writes:—

Raspberries?

Your magazine is fast becoming the most popular chemical journal in America. Keep up the good work. Why don't you expand the "We" page—it's the berries!

Who is reviewing my new book "Prosperity Beckons." Don't get a nit-wit on the job.

Washington, D. C. WM. J. HALE.

A Pet Peeve

I must read your monthly news review because it is the best summary of chemical happenings. It is well selected and usually gives me the facts with a real understanding of their relative importance. But why punish this faithful reader by adopting a smart alec style that is a mongrel cross between *Time* and Walter Winchell? And why oh why write the numeral "2" for the word "two"? This is my purely personal reaction, but such literary mannerisms are a pet aversion strong enough to prompt this letter of protest.

New York City. W. M. EASTMAN.

Efficiency Plus

Your periodical has improved so that I have discontinued all other chemical journals. I used to "skim" through five or six of them, now I *read* yours.

Hamburg, N. Y. J. W. FENGER

"Praise from Sir Hubert"

Your news and prices current are the most reliable sources of chemical data, and your editorials as good as Van Deventer's of *Iron Age*.

Boston, Mass UNITED BUSINESS SERVICE
Editorial Department

$50 for 25c

May I state that it was a total loss of knowledge not to have been a subscriber for many years past, inasmuch as many very essential and noteworthy trade topics were missed, judging from those in the one copy already before me, which are valuable enough. I may further state that in this sample copy, one item has already saved me fifty dollars, as an item of very deep concern in my own business was noted in that issue, the research of which and the further seeking information about, would have stood me no less than fifty dollars. Kindly, by all means, count me IN as a subscriber, and you may use any of the above with my full permission, in appreciation of the cooperation and service already rendered by your publication.

Mastic, New York. ALFRED BENDER.

Medical Papers Please Copy

May I congratulate you on the editorial entitled "Scientific Censorship" which appeared in your October issue.

For twenty-five years my work has been such that I am constantly and intimately in touch with the attitude of the American Medical Association. Although this Association has done much toward elevating the quality of medical men, it has developed a very selfish attitude. In the guise of being organized for the protection and profit of the public, it does a pretty good job of insuring the protection and profit of medical men in general. It is obvious that you have the A. M. A. and Dr. Fishbein sized up correctly. When the American Chemical Society recently capitulated to the demands of the American Medical Association, I was very much disappointed. Your editorial went right to the point and used the proper terms and phraseology.

The American Medical Association, if it had its way, would censor everyone and everything having to do with the comfort and welfare of individuals. I have no doubt that if shoes were just now invented they would demand that all clerks in shoe stores be medical graduates. This is not far-fetched because the A. M. A. makes demands equally ridiculous. I know Dr. Fishbein very well, and although he is aggressive and capable, he also possesses the make-up of a dictator who recognizes all territory and rights as his own.

I not only congratulate you for your excellent editorial which required courage to write and publish, but I hope you will not drop the matter with this one editorial. A great deal of good can be done for science in general as well as for the public by resisting the bureaucratic tendency and the tyrannical attitude of the A. M. A. and Dr. Fishbein.

Cleveland, Ohio. M. LUCKIESH.

The Pot and the Kettle

I get a good hearty laugh out of those complaints of the plant men who charge the consultants with "double crossing" the operating staff with the management. What said operating staff does to the equipment or apparatus engineer is aplenty. Is there no such thing as ethics in any branch of applied chemistry?

Providence, R. I. L. P. KERRIGAN.

Facts Wanted

May I second the motion made by Mr. Kobe that definite information as to the chemical that now is masked behind a fancy trade name ought to be given buyers. Oh! I know all the old commercial arguments behind the secrecy policy, but I don't think it is a wise one, notwithstanding. Chemicals are bought to be used to get some chemical reaction, and there are many men in consuming industries who have enough chemical knowledge to be suspicious of the salesman who repeats like a phonograph all that some new textile specialty will do, and who pleads ignorance as to why and how "because it's a new development of our research staff." That sort of blah! blah! is a great builder-up of the well known sales resistance.

Boston, Mass. JOHN H. LUNN.

So Do We

I prefer detective stories to your feature articles.

Cleveland, Ohio H. P. WALMSLEY.

Likes Sound Thinking

May I take this opportunity to congratulate you on the splendid job you are doing on the publication of CHEMICAL INDUSTRIES? I find it the most helpful general chemical journal that comes to my desk. While I don't always agree with your editorial point of view I recognize background and sincerity when I see them, and I think your editorials are doing much to encourage sound thinking on the problems of the day.

Bridgewater, Mass. HERMAN W. RICHTER.

CHEMICAL INDUSTRIES

VOLUME XXXIX NUMBER 5

"What the Industry Needs"

IN our justifiable pride over the advances made by chemical industry in the very teeth of the depression and our understandable preoccupation with marketing our new products, we overlook what gravely concerns both our technological progress and our industrial production.

It is being borne in upon us, however, that modern chemical technique demands greater and greater numbers of trained technicians. The old manpower ratios of the chemical plant are being turned up-side-down. Operations that a few years ago called for a hundred laborers and two chemists now require half a dozen skilled workmen and two score trained technical men. More than this, the spread of chemical processing into other fields is creating a vigorous competitor for the limited supply of competent chemists and chemical engineers.

Therefore, it is a good sign that our major executives are increasingly critical of the quality of their technical staffs. Each complaint about inadequate training and impossible personality is in truth a tribute to the growing esteem for technical competency and administrative ability. It is also a good sign that the last meeting of the Division of Chemical Education, at which several business leaders attempted to tell leading educators what the industry needs in its chemists, called forth a record-breaking attendance. Our technical schools and universities really want to supply the industry's demand.

That stimulating meeting suggests that chemical managers and chemical teachers might profitably get together under more informal circumstances and intimately discuss the training of chemists and engineers for industrial careers. A better mutual understanding of what is, after all, one of the very fundamentals of the work of both groups would be an extremely valuable contribution to chemistry.

Planning for the Chemical Industry

Complete and precise information on the belief that the chemical industry is exceptionally handicapped under any system of planned economy can be easily read between the lines in the impartial and matter of fact review of the German Government's decrees affecting chemical products which we print in this issue. Ostensibly an especial favorite of all the totalitarian states, only a chemical man may begin to appreciate how dangerous their well-intended attentions prove in practice to be. Few of us would care to operate a chemical business under these conditions. Yet there are many good Americans who sincerely believe that only by relinquishing our economic initiative to government control can we again be prosperous.

From 1776 to 1918 every change in any government followed the "American plan", which for over a century was the model of liberalism, the realization of man's long struggle for personal freedom from the fetters of church and state. Since the World War this American system has been challenged by a strange revival of the ancient doctrine that the government is supreme. In different forms Russia, Germany, and Italy are all trying out this idea, and some day a verdict will be found in Europe as to its soundness. In the meanwhile we cannot avoid the impact of this foreign concept of government upon our own political philosophy. The long, long battle for individual liberty must be fought again.

Chemicals in Warfare

World expenditures for rearmament have mounted a billion dollars a year since 1933 and in 1935 reached, according to the recent report of the League of Nations, $9,295,000,000. For obvious reasons chemical warfare is an item conspicuous by its absence in all national budgets, yet these feverish preparations are based upon plans for a quick, bold thrust that will promptly win a decision. Admittedly gas is the weapon for such a campaign. These were so obviously the two military lessons learned in Ethiopia that neither the most brassy dictator nor the most iron-bound general staff dare ignore them.

Abroad they are facing these facts. The American people wishfully consider gas an outlawed weapon, and in high army circles it is still considered an interesting, but unreliable novelty. The plain fact is that gas is the cheapest and most effective munition. Moreover, it can be produced in greater quantities more quickly than shot and shell.

Before six hundred physicians, gathered at the Academy of Medicine last month, officers from the Chemical Warfare Service and the Army Medical Corps spoke frankly about this matter and very properly emphasized that these lethal vapors, as the newspapers relish to call them, are vastly less deadly and horrible in their effects than bullets or shrapnel. The record is clear—2 per cent. fatalities from gas against 24 per cent. deaths from other weapons in all American casualties in France. The greater effectiveness of gas depends upon its ability not to destroy the enemy, but to render him temporarily useless. These army experts did well also to point out that stories of gases so deadly that a whiff can kill all the people of a great city are utterly unfounded. The effective range of even the most powerful war gases is very narrow, and an un-masked population would suffer far less from a gas attack than from high explosives released in our urban canyons.

In a world that is so feverishly re-arming all these facts need to be thoroughly understood. Neither popular sentimentality nor military inflexibility can realistically deal with this situation.

Politicians Cannot Always be Right

How perfectly our major political parties can dodge vital issues has been completely demonstrated during the past three months. By this evasion they rob democracy of any real meaning. If the people have no opportunity to make a clear-cut choice of public policy, their votes are but a meaningless symbol of the freeman's franchise.

That our practical politicians dare to appeal only to the fears, the greed, the prejudices of the public, comes unpleasantly close to public confession that our boasted educational system, our highly perfected means of communication, our alleged national common sense are all poppycock. Are we, the American people, such children that we can only be reached through our emotions? Are we too shallow to consider any serious presentation of a logical governmental program? Are we too flabby to come to grips with the realities of the present situation?

That, in so many plain words, is just what our practical politicians think of us. If they are right we do not deserve to govern ourselves. We should go right to work to find a nice benevolent despot, since he, so History teaches, gives the government best suited to weak-kneed, nit-witted people.

German Official Decrees Controlling Chemical Industry

By Sydney B. Redecker

American Consul, Frankfort-on-Main

Greater sales at less net profit mark German chemical company activities in the current year, during which control of the purchase, price, or production of methanol, crude coal tar, benzol, turpentine, nitrogenous fertilizers, naphthalene, linseed oil, mercury, glycerin, citric acid, all medicinal chemicals, and sulfur has been established by the Government. This special résumé of recent German developments is published through the cooperation and courtesy of the Chemical Division, Bureau Foreign and Domestic Commerce, U. S. Department of Commerce, at Washington, D. C.

DUE to artificial government stimulation of work-creation, rearmament, import-substitute production, etc., German industrial output continues a marked upswing and in the first quarter of 1936 gained 11.4 per cent. above 1935 or 84 per cent. above the depression-low point at the beginning of 1932. Based upon fuel consumption, chemical production reached a new high since 1932 of 93.7 for March, compared with 82.5 for March 1935, and an average of 79.5, 66.0 and 58.5 for the years 1935, 1934 and 1933, respectively. Nearly all leading chemical consuming industries, including building construction, textiles, paper, automotive, etc., registered further notable gains with a corresponding increased demand for chemicals.

Demand for paint materials and other chemical supplies required by the building trades reached a new peak. Production of dyestuffs, particularly those for uniforms, continued 1935's marked expansion to new high figures. Improvement in agriculture, with effective sales-promotion measures, increased the demand for all agricultural chemicals. Demand for nitrogenous fertilizers expanded by at least 13 per cent. in the fertilizer year 1935-36, to a new all-time peak of some 482,000 metric tons N, an increase of more than 47 per cent. over the depression-low and of more than 11½ per cent. over the all-time 1928-29 peak. Indications are that potash and superphosphate similarly recorded marked domestic expansion, with larger turnover than any year since 1932 and with the attainment of new peak levels, at least for potash.

Sales of chemicals were also greatly increased by entirely new domestic synthetic production in substitution for materials formerly imported, including fibers (rayon and cellwoll), gasoline, resins, chemically-produced substitutes for linseed varnish, etc., output of all of which increased greatly. Measures for conserving and reclaiming materials by chemical means, such as preservation, regeneration, processing of old and waste materials, etc., contributed to enlarging German demand for chemicals.

Restricted Earnings

In contrast to the heavy gains in production, earnings of German chemical companies have been relatively restricted in the last two years of forced economic revival. The striking disparity in production and profits reflects heavy financial burdens placed upon German industry by increased taxes, export-subsidization imposts, higher cost of imported and, more particularly, domestic substitute materials, increased cost of achieving maximum labor employment, rearmament, and especially heavy investments required to be taken from current operating income for developing new synthetic substitutes.

The disparity between gross and net income is portrayed by the financial results of the great I. G. Farbenindustrie now credited with upwards of 35 per cent. of German chemical production. From 1932 to 1935, the I. G.'s gross operating income gained 28 per cent. and the number of its workers expanded almost 60 per cent., net earnings increased less than 10 per cent. Heavy financial demands required for new synthetic production, with no possibility of issuing new securities due to the paucity of capital in the public investment market, are reflected in sharp gains in its investments in new capital equipment, from around 20,000,000 M, 1932; 40,000,000 M, 1933; 77,000,000 M, 1934, and 99,000,000 M (or almost one-sixth the total gross income) in 1935. On top of these heavily increased investments in equipment, I. G. was required to make heavy contributions to the 1935 national export-subsidization fund, reported as having totalled somewhere around 45,000,000 marks, a figure appearing as an unexplained item in the 1935 annual report, and corresponding to one-third the total contribution quota of 135,000,000 marks assigned the entire chemical industry.

The disparity in gross operating income and net

profits, characterizing the financial results of the German chemical industry, are set forth below:

Financial Returns of German Chemical Concerns

Gross Income 1934	Gross Income 1935	Net Income 1934	Net Income 1935	Dividend 1934	Dividend 1935
(Millions of Marks)				(Per Cent.)	
I. G. FARBENINDUSTRIE, Cap. 680,000,000 marks (Complete line of chemical products, heavy chemicals, dyestuffs, medicinals, etc., etc.)					
565.07	611.94	50.98	51.44	7%	7%
RUTGERSWERKE A. G., Cap. 27,800,000 marks (Coal-tar products, plastics, superphosphate)					
20.51	24.57	1.74	1.75	6%	6%
TH. GOLDSCHMIDT A. G., Cap. 16,500,000 marks (Tin derivatives, metal compounds, welding materials)					
4.15	4.64	0.63	0.84	5%	5%
CHEMISCHE FABRIK VON HEYDEN A. G., Cap. 13,700,000 marks (Pharmaceuticals, plasticizers, chemical specialties)					
7.31	7.772	0.55	0.57	4%	4%
CHEMISCHE FABRIK BUCKAU, AMMENDORF, Cap. 8,500,000 marks (Inorganics, soda, sulfuric acid)					
4.47	4.89	0.38	0.41	5%	5%
SACHTLEBEN A. G., Cap. 12,500,000 marks (Lithopone, barium, pyrites)					
8.66	9.31	1.17	1.12	9%	9%
CHEMISCHE WERKE H. & E. ALBERT A. G., Cap. 9,490,000 marks (Superphosphate, synthetic resins, pharmaceuticals, chemicals)					
2.70	3.42	0.56	0.62	4½%	5%
WESTFALISCH-ANHALTISCHE SPRENGSTOFF A. G., Cap. 10,000,000 marks (Explosives, nitrocellulose, synthetic resins)					
19.96	32.18	1.00	0.81	9%	8%

Marked tightening and extension of Government control in the chemical sphere continues, restricting consumption of imported raw materials, spreading available supplies, and forcing the use of domestic substitutes on a larger scale. Doubtless these more rigorous measures were found necessary owing to greater shortage of foreign exchange. The desire to promote the national program of "ersatz," or substitute production for the country's economic independence in time of war, is also strong. The consumption restriction measures instituted affected particularly American chemical raw materials, notably turpentine, carbon black, sulfur. Others affected were coal-tar derivatives, nitrogenous fertilizers, wood preservatives, methanol, paraffin, citric acid. Aside from restrictions upon imported chemicals, new measures were instituted in the chemical industry designed to achieve national economic coordination, adjustment of relationship of producers and consumers, etc., in accordance with National-Socialist political ideology.

Methanol is now a required ingredient of all gasoline, for the first time in Germany, by Government decree, effective January 1, 1936, in a ratio of one-tenth of the 10 per cent. admixture of ethyl alcohol in force for some years. Ethyl alcohol was thus reduced to 9 per cent. Effective July 1, 1936, however, the methanol was raised to 2 parts and ethyl alcohol correspondingly lowered to 8 parts. The required consumption of methanol creates an entirely new outlet for this product amounting to 450,000 hectoliters per year, taking up a notable share of the rapidly increasing methanol production in conjunction with the manufacture of synthetic gasoline at the I. G.'s Leuna works. By a still more recent decree, methanol is now required to be mixed separately in a ratio of 10 per cent. in all benzol destined to motor fuel consumption, independently of the subsequent blending of methanol with ethyl alcohol in the special spirit mixture. This further measure is calculated to create an additional motor fuel use of methanol of upwards of 30,000 metric tons. Due to the lower price of methanol, compared with ethyl alcohol, the price of the fuel admixture was reduced on June 1, 1936, from 50.00 marks per hectoliter in force December 31, 1935, to 44.50 marks. Methanol is considered an inferior motor fuel, having an efficiency of only 4,690 thermal units (Kcal/kg), compared with 5,700-6,360 for ethyl alcohol, 9,590-10,050 for benzol, and 11,160-11,280 for gasoline.

By decree effective July 1, 1936, the Government requires that all coal-tar be delivered to officially designated distillation plants with facilities for recovering light and medium oils, to insure maximum recovery of valuable coal-tar ingredients, especially naphthalene. The Government also decreed that all gas-works with yearly gas output of more than 2,500,000 million cubic meters shall install benzol recovery systems, calculated to increase the national benzol output by some 30,000 metric tons per year. In the latter part of 1935 official restrictions were instituted upon exports of coal-tar and various important derivatives, benzol, toluol, naphthalene, etc., having in view the insufficient domestic supply and rapidly rising domestic consumption.

Rigorous official control over the trade in carbon black was instituted May 1, 1936. Consumption quotas were established for all processors and consumers, based upon a percentage of 1935 figures, and the purchase of carbon black, both abroad and inland, was made subject to official permit. Later, upon the development of a new domestic substitute, carbon black from naphthalene, a decree was issued requiring that this product be consumed in a mixture of 20 per cent. for all manufacturing purposes, automobile tires, etc., requiring high grade gas black.

Effective May 28, 1936, the Government prohibited the use of turpentine for manufacturing furniture and floor polishes and restricted to 60 per cent. the turpentine content of solvents used for making shoe and leather polishes. Earlier in the year, benzol and other domestic solvents were required to replace turpentine for interior paints. More recently, deliveries of turpentine to retail paint stores were restricted and suppliers called upon to furnish instead domestic substitutes, hydro-turpene, dekalin, and sulfate turpentine occurring as industrial waste and by-products. The trade in talloel was subjected to all the restrictions applying to turpentine.

A new reduction, averaging 3 per cent., was required by the Government, effective July 1, 1936, in prices of all nitrogenous fertilizers, together with some revision in the make-up of the national price schedule. This price reduction introduced an important new principle for determining domestic fertilizer prices, namely, the degree of utilization of plant equipment, basically affecting the cost of manufacture. Under this new principle, the fixed domestic prices of the cartelized fertilizer industry in the future will move upward or downward in accordance with increases or decreases in national fertilizer consumption.

Under Government orders, a new, domestic, synthetic varnish, known as "El Varnish," was introduced upon the market as a required substitute for pure linseed-oil varnish for all interior surface coatings. This new product contains 30 per cent. pure linseed oil mixed with alkyd (glyptal type) synthetic resin, using as diluents benzol and gasoline in lieu of turpentine. The new national substitute varnish is designed to effect a substantial reduction in consumption of linseed oil, 65 per cent. of which hitherto has been for varnish. Pure linseed oil may now be used only for painting exterior surfaces.

To reduce consumption of mercury sublimate for wood preservation, the Government has decreed the use of domestic substitute materials, notably special salts mixtures produced from fluorides and dinitrophenols, arsenic and bichromates, considered efficient substitutes especially because of their resistance to leaching. Restrictions previously had been placed upon the use of mercurial substances for seed disinfection and in dental amalgams.

For spreading the insufficient supplies of fatty-acids arising from the severe throttling down on vegetable oil imports, the Government, effective January 1, 1936, abolished the former official standards for soap manufacture. These required that only those soaps might be designated as "grained soap" which were boiled down to spent-lye, or paste precipitate, and separated from their solution, and which moreover contained at least 60 per cent. fatty acid in hydrates. Most recently, a new decree was issued subjecting the entire national trade in glycerin to rigid Government control, having in view the shortage of this material resulting from the lessened processing of vegetable oil and its importance in time of war.

Under Government supervision, the candle industry, for the first time, was rendered 100 per cent. nationally cartelized. Domestic prices of candles have been increased, having in view the conversion of the industry to an entirely domestic raw material (paraffin) base, and the prospects of complete exclusion of imports, supplying formerly the greater part of the industry's paraffin requirements. The shift in source of raw material (paraffin) supply is linked to the greatly increased production of domestic brown-coal tar by means of low-temperature carbonization (from 225,000 metric tons in 1934 to over 400,000 tons at present) in connection with the augmented output of synthetic gasoline by hydrogenation of brown coal tar.

Valid from March 12 to September 30, 1936, the Government prohibited the enlargement of productive capacity for citric acid. This measure was taken to offset the danger of expanding capacity beyond national needs in times of resumed import supply to the injury especially of producers responsible for developing the existing German citric acid industry. By decree of March 4, 1936, the Government prohibited the export of zinc gray, adding this product to the previous list issued in the latter part of 1935.

All publicity, advertising, sales propaganda, etc., concerning medicinal preparations and treatments were affected by new legislation in effect August 1, 1936, setting forth new, stricter, and nationally uniform principles of official control over publicity in the medicinal sphere, in the interest of the public, while conserving the commercial incentive of responsible manufacturers.

Latest information indicates that a new Governmental decree is now in preparation for regulating the price, consumption, and production of sulfur and subjecting the entire sulfur trade to strict official supervision. While details of this impending decree are not yet available, its purpose apparently is the reduction of sulfur imports and stimulated use of domestic materials, elemental sulfur from coal and brown-coal gases, domestic pyrites, gypsum, etc., in lieu of imports.

Chemicals for Cuprammonium Rayon

Interesting particulars on the cuprammonium process of rayon manufacture were given by Dr. Höllwig, of the I.P. Bemberg A.G., of Wuppertal-Oberbarmen, to the recent meeting in Berlin of the Verein der Zellstoff und Papier Chemiker und Ingenieure. Annual production of cuprammonium silk in Germany is about 5.9 million kgs., or 12 per cent. of the total output of artificial silk. The rise in production has been progressive since 1921. The Bemberg company, at its two works in Wuppertal-Oberbarmen and Dormagen, has a daily production capacity of 25,000 kgs.

Raw material consumption per kgs. of cuprammonium artificial silk is approximately as follows: 1.25 kgs. linters, 1.70 kgs. copper sulfate, 0.65 kgs. soda, 3.0 litres 25 per cent. ammonia, 14 kgs. coal, and about 3 cubic meters water. Eighty-five to 90 per cent. of the copper utilized is recovered. Referring to recent developments in the industry, Dr. Höllwig mentioned the production of cuprammonium rayon in the matt condition by the direct addition of titanium salts to the copper solution.

So far no raw material had been found capable of replacing cotton linters, the cost of which accounted for about one-twentieth of the sale price of Bemberg artificial silk. Despite the incidence of this cost, the industry was profitable. Replying to various questions, Dr. Höllwig stated that the average loss in weight of the linters during their preliminary purification was about 16 per cent. A good deal of work had been carried out, and was being continued, on the utilization of high-grade sulfite pulp as raw material. Although recent indications were promising, the industry has not yet replaced linters. The cuprammonium silk industry required a raw material which contains at least 96 per cent. of alpha cellulose. Materials which might possibly come up to these exacting requirements were a new Swedish sulfite pulp (Uddeholm) and a beechwood cellulose that was being developed by the I.G.

Coal-tar Dye Production—

A Measure of Industrial Recovery

ONE of America's color experts, Herbert Thompson Strong, once stated: "Years ago, during a visit to England, I was permitted to study the swatch books hundreds of years old. In these I interpreted the history of England. Sombre black and dull grays silently told the story of great depressions; flaming colorful hues bespoke of great days of prosperity." Mr. Strong's quaint theory is substantiated by the unmistakable current trend to lighter, brighter shades.

But of even greater significance as an authentic measure of world-wide recovery are the cold figures of dye production. World output in 1935 amounted to 235,000 metric tons, compared with 211,000 tons in 1934, an increase of approximately ten per cent. Preliminary estimates for 1936 indicate as great, if not a greater, increase.

The bouncing rise of Japan to fifth place and her challenge to Soviet Russia for possession of fourth place was the important development of 1935. Expansion in Japanese production is revealed by the figures for the depression years: 1930, 7,780,366 kilos; 1931, 9,659,380; 1932, 14,043,101; 1933, 15,972,839; 1934, 17,115,723; 1935, 20,000,000 (estimated).

In the past 18 months Japan has appeared bolder in the international markets. Formerly she was largely a dye importer. She has edged into the lucrative Indian market, which is the Imperial Chemical Industries' largest foreign outlet, into Holland, where there are no tariffs; and into China long considered an open market for Germany, Britain, and the United States. Her sales campaigns have been so aggressive as to call forth a politely worded, but nevertheless firm, threat of reprisals from the chairman of the I.C.I.

Japan has obtained, however, her first objective—a trading position against the closely united International Dye Cartel. With exports of 19,583,000 pounds and imports of only 2,771,000 pounds in 1935, her export position is established and must be recognized. It is safe to believe that Sir Harry McGowan's "hope" that "common sense will eventually prevail and that a reasonable basis of mutual understanding will be reached" will shortly be fulfilled, if indeed, a satisfactory basis of market distribution has not already been arranged.

Germany Clings to Number One Position

Germany, despite increasingly difficult exchange and tariff problems, has maintained her position as the largest producer. In 1929 German output was 75,000 metric tons. By 1933 it was but 66,000 tons. In 1934 it rose to 76,000 and probably reached 78,000 tons in 1935. In second position was the United States with a production of 45,480 metric tons in 1935, a decline of nine per cent. under the 1929 peak, but 17 per cent. greater than in 1934. Great Britain was in third position with 26,250 tons, an increase of 11 per cent. over 1934, and, according

U. S. Dye Industry Statistics*

Year	No. of Firms	Dyes Produced	Value of Production	Average Price per lb.	U. S. Dye Exports (lbs.)	Value	U. S. Dye Imports (lbs.)	Value	Dye Sales (lbs.)	Value of Dyes Sold
1914[3]	7	6,619,729	$ 2,470,096	$0.37	....	$ 356,919[2]	$45,950,895	$9,502,714	..........[1]	..........[1]
1917	81	45,977,246	57,796,228	1.26	....	11,709,281	..........[5]	....	..........[1]	..........[1]
1918	78	58,464,446	62,026,390	1.07	....	15,265,710	..........[5]	....	..........[1]	..........[1]
1919	90	63,402,194	67,598,855	1.07	....	15,728,499	..........[5]	....	..........[1]	..........[1]
1920	82	88,263,776	95,613,749	1.08	....	29,823,591	3,402,582	5,763,437	..........[1]	..........[1]
1921	74	39,008,690	....	.83	....	6,270,139	4,252,911	5,156,779	47,513,762	$39,283,956
1922	87	64,632,187	....	.60	8,344,187	3,996,443	3,982,631	5,243,257	69,107,105	41,463,790
1923	88	93,667,524	....	.545	17,924,200	5,565,267	3,098,193	3,151,363	86,567,446	47,223,161
1924	78	68,679,000	....	.54	15,713,428	5,636,244	3,022,539	2,908,778	64,961,433	35,012,400
1925	75	86,345,438	....	.47	25,799,889	6,694,360	5,209,601	4,637,240	79,303,451	37,468,332
1926	61	87,978,624	....	.42	25,811,941	5,950,159	4,673,196	4,103,301	86,255,836	36,312,648
1927	55	95,167,905	....	.39	26,770,560	5,495,322	4,233,046	3,413,886	98,339,204	38,532,795
1928	53	96,625,451	....	.43	27,824,264	6,531,619	5,351,951	4,321,867	93,302,708	39,792,039
1929	54	111,421,505	....	.43	34,130,325	7,279,086	6,437,147	5,374,085	106,070,887	45,842,130
1930	50	86,480,000	....	.43	28,267,340	6,245,830	4,114,882	3,500,154	89,971,599	38,621,610
1931[4]	..[5]	83,526,000	....	.45	20,312,768	4,738,737	4,736,712	4,099,521	85,220,000	38,564,000
1932	..[5]	71,269,000	....	.45	16,096,824	4,071,438	3,903,236	3,516,347	73,591,000	32,944,000
1933	46	100,952,778	....	.44	18,740,356	4,652,726	4,288,214	4,791,704	98,238,398	43,102,469
1934	43	87,177,612	....	.51	17,942,203	5,629,666	3,392,717	5,035,325	84,309,045	43,250,615
1935	40	101,932,661	....	.53	19,630,924	6,873,404	3,638,177	5,489,547	97,954.464	51,488,361

* No statistics are available in regard to dye imports for the years 1917, 1918, 1919, nor statistics of exports for the years 1914 and 1917-21. The statistics of dye imports from 1920 forward are from the compilations made by the U. S. Tariff Commission and published by the Dept. of Commerce. The figures representing these imports are smaller than those shown in Foreign Commerce and Navigation of the U. S. for 2 reasons, namely, lack of complete coverage, and by the broader statistical classifications in the official figures. The values of dye imports, as shown in the U. S. Tariff Commission classifications, are of course, the invoice values, whereas those shown in Foreign Commerce and Navigation are the dutiable values. From 1921 on the Tariff Commission did not compile figures for the value of domestic production, showing only the value of the sales of domestic dyes, which correspond very closely in quantity to the production.

[1] Not given. [2] Includes coal tar and dyes. [3] Fiscal year. [4] Estimated. [5] Not available.

U. S. Production and Imports of Dyes by Classes of Applications
(U. S. Tariff Commission)

	Acid		Basic		Direct		Unclassified		Lake & Spirit Soluble		Mordant & Chrome	
Year	Imports	Domestic Production	Imports	Domestic Production	Imports	Domestic Production	Imports	Domestic Production	Imports	Domestic Production	Imports	Domestic Production
1914	9,286,501	a[2]	3,002,480	a[2]	10,264,757	a[2]	27,568	.......[2]	1,512,605	a[2]	4,450,442	a[2]
1915	........[2]	........[2]	......[2]	.......[2]	.......[2]	........[2]	......[2]	.......[2]	......[2]	.......[2]	......[2]	.......[2]
1916	........[2]	........[2]	......[2]	.......[2]	.......[2]	........[2]	......[2]	.......[2]	......[2]	.......[2]	......[2]	.......[2]
1917	........[2]	9,372,121	......[2]	2,073,043	.......[2]	11,181,761	......[2]	2,368,541	......[2]	934,360	......[2]	4,164,902
1918	........[2]	9,799,071	......[2]	2,879,639	.......[2]	12,285,683	......[2]	4,232	......[2]	1,068,466	......[2]	5,447,192
1919	........[2]	12,195,968	......[2]	4,036,532	.......[2]	14,444,934	......[2]	49,111	......[2]	1,813,199	......[2]	3,985,050
1920	733,405	17,741,538	192,163	4,993,001	571,581	19,882,631	16,820	168,517	17,527	2,205,281	709,482	3,900,209
1921	1,455,823	7,843,009	163,527	1,853,094	537,664	7,053,761	19,100	282,603	43,553	720,406	695,961	3,997,442
1922	601,395	9,880,014	155,084	2,937,585	671,621	11,931,737	16,981	1,283,127	76,853	1,009,512	716,790	3,749,701
1923	544,048	12,498,817	210,896	4,157,373	527,014	16,858,387	18,030	3,230,478	23,213	1,171,854	453,415	4,078,504
1924	324,538	9,187,256	249,068	3,676,997	421,538	14,662,577	9,073	851,354	17,334	967,550	413,902	2,953,987
1925	589,959	10,214,024	607,637	4,121,735	759,024	14,787,840	12,271	581,162	57,540	1,606,795	642,098	2,543,292
1926	793,855	10,441,443	406,732	4,406,073	805,848	18,039,705	82,914	773,176	86,106	1,428,100	500,004	3,134,934
1927	654,729	11,104,533	334,526	4,548,515	721,342	16,265,497	30,235	300,427	134,778	1,540,711	488,605	3,604,095
1928	994,201	13,469,597	424,968	5,374,099	917,728	19,633,095	10,178	545,512	98,550	1,821,492	476,872	4,403,934
1929	1,491,313	14,196,815	367,568	5,899,970	977,792	21,622,907	12,898	740,737	204,248	2,724,712	545,508	4,846,228
1930	904,859	11,457,235	215,197	4,649,898	810,545	17,553,462	6,645	584,929	155,051	2,560,936	249,982	3,137,164
1931	979,953	........[2]	187,590	.......[2]	1,116,430	........[2]	10,368	.......[2]	104,325	.......[2]	308,440	.......[2]
1932	702,172	8,343,000	113,355	3,509,000	1,237.865	16,600,000	25,677	666,000	70,086	3,274,000	212,436	2,920,000
1933	732,405	11,999,772	117,476	4,645,550	906,101	21,704,072	8,374	794,327	36,615	3,209,242	321,206	5,318,385
1934	558,684	11,635,651	91,167	4,380,981	798,541	21,263,095	10,301	570,526	40,768	3,580,534	244,715	4,154,390
1935	785,797	14,593,749	109,222	5,389,058	999,906	26,073,439	1,170	710,555	59,371	2,081,012	317,436	6,264,133

	Sulfur		Vats Including Indigo		(a) Indigo[4]		(b) Other Vats		Acetate Silk (Print)	Rapid Fast	Artificial Silk
Year	Imports	Domestic Production	Imports	Domestic Production	Imports	Domestic Production	Imports	Domestic Production	Domestic Production[1]	Imports[1]	Imports[1]
1914[3]	7,053,879	a[2]	10,352,663	a[2]	8,507,359	a[2]	1,945,304	a[2]	....	......	......
1915	.......[2]	........[2]	.......[2]	........[2]	....	........[2]	.......[2]	........[2]	....	......	......
1916	.......[2]	........[2]	.......[2]	........[2]	....	........[2]	.......[2]	........[2]	....	......	......
1917	.......[2]	15,588,222	.......[2]	289,296	....	274,771	.......[2]	14,525	....	......	......
1918	.......[2]	23,698,826	.......[2]	3,281,337	....	3,083,888	.......[2]	197,449	....	......	......
1919	.......[2]	17,624,418	.......[2]	9,252,982	....	8,863,824	.......[2]	389,158	....	......	......
1920	229,140	20,034,500	932,464	19,338,099	....	18,178,231	761,363	1,159,868	....	......	......
1921	220,938	10,239,255	1,116,345	7,019,120	70,975	6,673,968	1,045,370	345,152	....	......	......
1922	194,883	16,913,767	1,549,024	16,926,744	505	15,850,752	1,548,519	1,075,992	....	......	......
1923	114,023	21,558,469	1,207,554	30,113,642	....	28,347,259	1,207,554	1,766,383	....	......	......
1924	87,764	14,561,257	1,499,322	21,818,022	5,471	19,996,703	1,493,851	1,821,319	....	......	......
1925	122,230	20,760,512	2,418,842	31,730,178	1,952	29,121,817	2,416,890	2,608,361	....	......	......
1926	149,723	20,023,242	1,848,014	29,731,951	2,806	25,701,530	1,845,208	4,030,421	....	......	......
1927	137,864	23,404,273	1,730,967	34,399,854	6,057	28,438,166	1,724,910	5,961,688	....	......	......
1928	125,350	19,001,910	2,304,104	32,375,812	2,343	25,861,680	2,301,761	6,514,132	....	......	......
1929	142,919	22,605,799	2,694,901	38,784,337	....	29,320,270	2,694,901	9,464,067	....	......	......
1930	56,643	14,232,076	1,715,960	32,304,300	....	24,326,403	1,715,960	7,977,897	....	......	......
1931	73,601	........[2]	1,956,005	........[2]	....	........[2]	1,956,005	........[2]	....	......	......
1932	52,917	15,195,000	1,488,728	20,763,000	....	13,752,000	1,488,728	7,010,000	....	......	......
1933	90,262	20,188,008	1,339,218	33,093,422	....	23,412,400	1,339,218	9,681,022	....	149,750	586,007
1934	70,669	13,441,952	911,354	26,963,234	....	15,818,492	911,354	11,144,742	1,187,255	137,775	528,743
1935	77,340	16,949,143	784,253	27,908,296	....	13,614,238	784,253	14,294,058	1,963,276	......	503,682

[1] Included in direct dyes where not separately shown.
[2] Not available.
[3] Fiscal year.
[4] Figures for indigo for 1921-8 may include natural indigo.

to a report from the American Consul in London, 1936 production will likely exceed 60,000,000 pounds. This would be an all-time record, more than six-and-one-half times the pre-war output, and two-and-one-half times 1920. It was during that year the industry was placed on the protected list (Dyestuffs Import Regulation Act of 1920).

Russia was in fourth place in '35, with an estimated production of 25,000 tons, compared with but 16,000 tons in 1930. But, unlike Japan, the Soviet output is largely absorbed domestically, and as yet she has not presented any undue difficulties to the International Cartel. Like Japan, however, the desire for self-sufficiency in dyes by the Soviet leaders has cut short a profitable outlet for other producers. Except for special dyes, equipment for the manufacture of which the Soviet industry does not possess, the entire local demand is now satisfied at home. Special equipment is being installed however, and complete self-sufficiency probably will be a reality by the end of 1936.

"'Gone with the wind" are two most important foreign outlets for the dyes surplus of leading producing countries.

Where will they find new markets?

Improved conditions will doubtless increase dye consumption in most countries in 1937; the coronation of the King of England will stimulate dye consumption, but unless the "Heathen Chinee" becomes more dye conscious and mysteriously obtains the money to pay for increased tonnages, the outlook for those dye-producing countries which depend heavily upon exports is not particularly bright. Despite general world-wide recovery Chinese dye importers estimate that business for the first five months of 1936 was 10 per cent. below the same period for last year. They hopefully report that this is but a temporary condition caused by the uncertainty over smuggling

and politics. Conditions in India appear more favorable than in China. The following breakdown of total Indian imports of coal-tar dyes by countries of origin, for the fiscal years ending March 31, tells its own story:

Country	1934-35 Pounds	1934-35 Rupees	1935-36 Pounds	1935-36 Rupees
United Kingdom	1,992,773	3,275,363	2,184,161	4,157,974
Germany	13,433,981	19,062,681	13,854,353	20,144,542
Switzerland ...	654,395	1,706,527	675,119	2,012,648
Japan	1,194,178	1,017,853	1,404,542	1,233,217
United States ..	1,023,713	1,071,486	1,427,137	1,424,447
Other countries	1,057,268	1,252,255	906,371	1,389,992
Total	19,356,308	27,386,165	20,451,683	30,362,820

Germany and Switzerland are the two producing countries seriously dependent upon exports. Switzerland's 1935 exports of 6,577 tons accounted for approximately 95 per cent. of total production, while Germany exported 33,933 tons in 1935 out of a production of 78,000 tons, or roughly 43 per cent. Successful negotiation of a reciprocal trade pact with the United States in January this year gave Swiss producers concessions (as much as 23 per cent. in the medium priced dyes), improving their position tremendously in our domestic markets. American producers are watching Swiss imports to determine the practical results of the Hull Pact—a break—even for Democratic tradition which is to protect our dye industry. Germany's tariff troubles with the United States did have a detrimental effect on her profitable exports of dyes, and permitted Swiss producers to increase their share in 1933, 1934, and 1935. This important switch is shown by import figures of these two countries for 1931-1935*:

	Germany	Switzerland
1931	2,891,439 lbs.	1,665,435 lbs.
1932	2,492,421	1,548,414
1933	2,544,713	2,108,442
1934	2,010,784	2,131,491
1935	2,120,071	2,386,386

* From Vol. X, Comparative Statistics of Imports into the U. S. for Consumption by Countries, U. S. Tariff Commission, W.P.A. Statistical Project 65-31-2075.

Curiously German dyes in the first half of 1936 won a larger percentage of total imports, in comparison with the corresponding period of 1935. Imports from Switzerland were greatly reduced in percentage. The various countries' share in imports so far this year and for the first half of 1935 were as follows:

	Percentage (quantity) 1935	Percentage (quantity) 1936
Germany	49.66	52.58
Switzerland	49.21	44.12
England	1.02	1.63
All others	0.11	1.67

Our imports of dyes for consumption in the first half of 1936 dropped 17 per cent., compared with the same period of last year: total of 1,502,193 pounds with an invoice value of $2,156,463, as against 1,810,-935 pounds and a value of $2,630,067.

Dye imports, classified by the Department of Commerce according to method of application, for the two six-months periods are:

	1936 Pounds	1936 Foreign Invoice Value	1935 Pounds	1935 Foreign Invoice Value
Acid	328,807	$494,124	380,177	$533,702
Vat	447,189	629,382	444,001	632,567
Mordant and chrome ...	133,965	162,896	199,823	221,279
Direct	*404,409	590,923	491,725	683,654
Rayon	60,804	100,638	184,780	399,219
Basic	53,279	86,269	49,911	94,871
Sulfur	51,676	37,119	39,331	26,527
Color-lake and spirit-soluble	21,755	54,489	20,305	37,413
Unclassified, miscellaneous	309	643	882	835

* Includes rapid fast dyes.

The U. S. Path to Self-Sufficiency

The United States has some distance yet to travel to complete self-sufficiency, although there is no analogy to the helpless position at the outbreak of the World War when production by but seven producers totalled a mere 6,619,729 pounds, valued at $3,470,-096 and our imports amounted to 45,950,895 pounds valued at $9,502,714. At that time Germany's total dye production was worth $70,000,000 annually! Our imports of coal-tar dyes amount now to about five per cent. by weight and 20 per cent. by value of our consumption. These figures clearly indicate how largely imports are of the more expensive types. On a relatively few types of special dyes we are still dependent on outside sources, but for all practical purposes we are now, and have been for several years, self-contained. Furthermore, our importance in the export markets is constantly increasing.

United States Production of Dyes by Colors and Classes of Application, 1935*

	Blacks	Blues	Browns	Greens	Oranges	Reds	Violets	Yellows	Total
Acid	3,385,096	2,513,233	475,566	656,246	1,790,774	2,644,261	671,276	2,033,377	†14,269,831
Basic	23,670	949,879	725,109	282,970	659,385	808,735	1,008,600	932,710	5,389,058
Direct	12,994,624	3,122,522	2,255,325	944,180	749,063	3,024,903	442,030	2,542,792	26,073,439
Acetate silk	649,127	367,568	6,983	......	174,862	220,214	98,653	239,658	‡1,963,276
Lake and spirit-soluble ..	930,860	96,075	4,038	2,365	297,438	587,144	2,804	160,290	2,081,012
Mordant and chrome	3,760,872	184,313	858,472	119,150	35,612	664,405	17,035	624,274	6,264,133
Sulfur	12,067,262	1,620,154	1,997,171	217,857	29,681	789,704	......	227,334	16,949,143
Vat	602,819	22,063,302	1,646,796	799,488	700,822	494,062	383,698	1,217,309	27,908,296
Unclassified	....	....	......	......	.....	......	......	......	710,355
Total	34,414,330	31,017,044	7,965,460	3,022,258	4,437,817	9,233,428	2,624,098	7,977,744	†‡101,608,743

† Food dyes not included.
‡ Includes 206,211 pounds not classified by color.
* Prepared by U. S. Tariff Commission.

In 1935 we had a small but favorable dye trade balance, $6,873,000 to $6,034,000. In volume our exports for the year totalled 8,800 tons, an increase of approximately 15 per cent. over the previous year, while the value increase was approximately 22 per cent. While Japan, China, and Canada are outstanding markets for American dyes (the three taking together more than half the total) substantial shipments were also made to other countries, including British India, The United Kingdom, Belgium, Germany, Mexico, Argentina, and Brazil.

Although statistics of current dye production are not yet available domestic consumption in 1936 will unquestionably exceed the 1935 total. Activity in textiles and leather has expanded; the consumption of dyes in certain of the newer industries, such as plastics, is increasing rapidly. Exports of coal-tar products, particularly dyes, are advancing substantially, the total for the first quarter reaching the value of $3,786,000, compared with $3,382,850 for the corresponding quarter of 1935. In this group the exports increased in quantity from 4,626,500 pounds to 6,209,780 pounds, and the value advanced from $1,589,500 to $1,979,500.

Prophecies of future international dye trends are difficult to make because of rapid changes in the foreign situation. Within the past month France devaluated the franc and Italy the lira; the United States, England, and France have joined in a movement to stabilize foreign exchange. But considerable doubt exists as to how long Germany, despite Hitler's protestations against the evils of devaluation, can withstand the pressure. Unquestionably monetary and political considerations will exert in the future tremendous influence in the placing of dye contracts—even more so than they have in the past.

Intense nationalism is rampant. The desire for self-sufficiency in vital chemicals, first expressed in the mad rush for synthetic nitrogen immediately following the World War, has spread to other materials and, of course, to dyes. Secondary countries, such as Poland and Czechoslovakia, are developing important dye plants. While the world's total production will probably continue to expand as industrial recovery gains, quite likely the exports of certain countries will fail to advance in anything like the same proportion and may even in some instances actually show declines. A radical readjustment and realignment of the dye cartel is quite within the realm of probabilities.

Improved Magnesium Process

Magnesium metal is usually produced by the electrolysis of anhydrous magnesium chloride, using a flux of molten salts to carry the electrolyte. Main disadvantage of this method lays in the necessity for a temperature of about 700° C. to ensure liquidity, and at that temperature there is also some loss of the reduced metal by vaporization. In addition it is necessary to use perfectly anhydrous magnesium chloride, which is also free from oxides and alkali metals. Attempts to produce magnesium from natural magnesium compounds by reduction with carbon have failed owing to the complete reversibility of the reducing reaction; at ordinary pressures equilibrium is on the metal-forming side only above 2,000° C., when the metal is in the vapor phase, yielding—when condensed—a mixture of metallic dust, oxide in considerable quantity, and soot.

In an improved process of Austrian origin the metal is extracted in 2 stages. Magnesium oxide, obtained by calcining magnesite or dolomite, is reduced by carbon in an electric furnace at a temperature of about 2,000° C., which is well above the boiling point of magnesium metal. The reduced magnesium leaving the furnace in vapor form along with the carbon gases is then filtered from accompanying dust and rapidly cooled to 200° C. In the 2nd stage this cooled product, which is a mixture of magnesium metal, oxide dust and soot, is conducted to the hot zone of an electric furnace and heated to 800-1,000° C. in partial vacuum (20-100 mm. mercury) in the presence of hydrogen or methane. Here the magnesium is vaporized and, being brought into contact with a cooling surface, its temperature is lowered to the liquefying but not to the solidifying point, and the liquefied metal in the form of drops falls into a bath of hydrocarbon oil of high boiling point. This oil causes the coalescence of the drops into granules 10-20 mm. diameter and at the same time separates any dust, so that the metal is isolated at a purity of about 99.97%. Metal and dust, moreover, can be easily and independently separated from the oil. Aluminum can be used as the reducing agent instead of carbon, thereby eliminating the formation of gases so that only magnesium vapor escapes from the furnace. New process is favored because of the high purity of the resulting magnesium metal. *Chemical Age* (British), Oct. 3, '36, p19.

Lime Industry in 1935

Lime sold or used by producers in the U. S. in '35 amounted to 2,987,133 short tons valued at $21,748,655, according to figures compiled by the U. S. Bureau of Mines from reports furnished by lime manufacturers. This represents an increase of 25 per cent. in quantity and 27 per cent. in value compared with '34. Sales of hydrated lime, which are included in the above totals, amounted to 1,005,619 tons valued at $7,939,513, an increase of 21 per cent. in quantity and 26 per cent. in value. The average unit value of all lime in '35 was $7.28 a ton compared with $7.16 a ton in '34; hydrated lime showed an increase from $7.63 a ton in '34 to $7.90 a ton in '35. The total number of plants that reported operations in '35 was 301 or 23 less than in '34, due chiefly to the non-operation of field kilns and the closing of small plants.

Sales of lime for agricultural uses—282,660 tons valued at $1,901,839, increased 27 per cent. in quantity and 29 per cent. in value; sales for construction—656,894 tons valued at $5,716,802, increased 28 per cent. in quantity and 34 per cent. in value; sales of lime used in the manufacture of chemicals—1,592,321 tons valued at $10,344,180, increased 19 per cent. in both quantity and value. Of the total chemical lime produced in '35, 26 per cent. (407,722 tons) was reported sold for minor and unspecified uses. Refractory lime (dead-burned dolomite) sold or used by producers in '35 amounted to 455,258 tons valued at $3,785,834 and represented a gain of 40 per cent. in both quantity and value. Ohio, the largest producer of this product, had an output of 232,983 tons valued at $2,063,834 in '35. Other producing States are Alabama, Illinois, Pennsylvania, and West Virginia.

Ohio, the largest producing State (707,358 tons valued at $5,690,656 in '35), showed an increase of 26 per cent. in quantity and 33 per cent. in value, and Pennsylvania, the second State in rank (531,501 tons valued at $3,703,339 in '35), increased 22 per cent. in quantity and 17 per cent. in value compared with '34.

What Price Technical Service?

One of the most prickly problems of the Patman Law discussed in a symposium of chemical consultants.

Unfair Competition

By S. R. Church

FOR over twenty years I was employed by a company which went in pretty strongly for boosting its sales and distribution of new products by technical education of prospective customers. Within reasonable limits I believe this policy is an enlightened one.

I do not entirely agree with your flat statement that the services offered by larger companies "handicap the smaller chemical makers." The educational value of this service performed by the larger companies cannot, in the nature of things, be restricted to their own advantage. The smaller producer likewise receives some of the benefit of this education, and if he is smart enough, can apply to his own benefit.

Speaking as a professional consulting chemist, I have no objection to this policy of the larger chemical producers, and, although it comes to me as a news item, I see no objection to the move on the part of Dow in forming a service corporation.

On the other hand, I feel that the professional consultant has a definite grievance against the increasing amount of "service" that is being performed by members of the faculty of various educational institutions (a notable example is right here in New York). These men are paid good salaries, have no overhead expense and command the assistance of students. When they compete with their fellows in the consulting field they are doing something which, I think, is decidedly unsportsmanlike and unethical.

"Something for Nothing"

Harald Ahlqvist

AS far as I can remember, all the producers of chemicals with whom I have been working have had a technical service department. Sometimes this department has been independent, sometimes affiliated with the sales department. The duties of the technical service department have mainly been the investigation of complaints, correction of errors, and advice on uses of the company's product. In practically all of the cases where technical service has been called for the customer has considered himself entitled to such service free because, for one reason or another, he was under the impression that his trouble was due to some error of the chemical manufacturer. Sometimes the complaint was justified, sometimes not.

As a consulting engineer for the manufacture (not uses) of alkali, my competitors have to a great extent been the engineers employed by the equipment builders. How these could get along without engineers is not imaginable. My business has been to know more than they did about the uses of their equipment.

To speak of technical service as being free is slightly misleading. The customers pay for it though it does not appear as a special item on the invoice; sometimes it is part of the sales cost, sometimes part of the general expense.

One customer may avail himself of it more frequently than another, but it is equally open to all, and it is by far not the case that the small customer wants something for nothing, the big customer is much more apt to make unreasonable demands.

Psychoanalysis Needed

Earl P. Stevenson

President, Arthur D. Little, Inc.

SURELY none of us have suffered a greater calamity than those selected individuals who are forced by the circumstance of the Patman Law to fix the discount rates on chemical products that are backed by technical services. From the long experience of our organization in serving the industrial users of chemical products it would seem that the Patman Law has propounded a problem that has no rational solution other than one that is purely arbitrary and hence necessarily unfair in many of its applications.

It would almost seem as if a seller would have to have his customer psychoanalyzed and then subjected to a series of intelligence tests to arrive at a factor by which the allocation of the cost for technical services could be fairly applied in setting up a schedule of discount rates.

Referring to the editorial in CHEMICAL INDUSTRIES for October, "Technical Service," we do not expect the Patman Law in its bearing upon the "free" technical service of chemical manufacturers to affect adversely the business of the independent chemical consultants. The clients of the consultant are generally familiar with the type and kind of service offered by the supplier of chemicals and have grown to depend upon this service with relation to problems that are a matter of common knowledge. The limitations of this service are well appreciated, and such competition as might be said to exist between the independent consultant and the laboratories of the chemical manufacturer is on the whole a healthy one. The fact that the chemical manufacturer is not in a position to render the same degree of confidential service as the consultant is recognized by all parties concerned. Fortunately for the manufacturer, his customers are constantly and steadily developing new uses for the products which he manufactures, and in the initial stages of these developments the user has grown to depend upon his own technical staff aug-

mented by such assistance as he may require of a consulting nature.

This organization therefore does not feel that the Patman Law has raised any issues that will materially affect its business relations one way or the other. In this side-line position we do, however, extend condolences to those who are required to establish a formula by which the manufacturer of chemicals may continue to do business under the lengthening shadow of government supervision.

Consumers Shouldn't Pay

Charles S. Venable
Viscose Company

"TECHNICAL Service" is a necessary accompaniment to a technical product but we have very little conception as to how the Patman Law comes into the picture. We do not agree with the Dow idea of a separate corporation.

"Technical Service" is something the consumer should not be required to pay for directly and is something that the producer should be glad to render, in as much as it keeps him intimately informed of the behavior of his product.

"There Ought to be a Law"

John A. Seaverns
Howe & French, Inc.

I SUPPOSE that every business man in the United States and probably all consulting engineers and chemists are rather disturbed over the possibilities of the Patman Act.

I suppose further, that the great American public will never learn that goodness and honesty are not matters that can be affected particularly by legislation. They are, and remain until the end, matters of education.

The attempts which have been made in the past four years to legislate goodness into business have only resulted in greatly added expense in the cost of doing business, which in turn is reflected in the price of merchandise; and schemes to enable the wily to escape if possible from the clutches of the Law.

At every meeting of my competitors I have noted that those who made the greatest noise exploiting the importance of concerted action, were primarily interested in benefiting the manufacturer and dealer (not the consumer or buyer) and that they almost invariably showed evidence that whatever scheme to accomplish these ends was being proposed that they did not acquiesce to it until they had thought out some way in which they could beat it. Almost everyone felt that "There ought to be a Law" (and then parenthetically for the other fellow, but not for him).

The Patman Act is carrying this thought to the nth degree.

It is fully out of reason to suppose that any manufacturer having a supply of goods on hand could justify himself to his stockholders if he turned down a proposition from a probable buyer because that buyer wished to purchase a quantity of these goods to be delivered as the buyer might elect, to such destinations as he might choose, but at a quantity price for the total purchase. No one could consider that it was good business to do this. Nor can I see how any business man can fail to appreciate the importance of maintaining the good-will of his larger customers by caring for their smaller wants from time to time on the basis of prices made for their larger purchases.

To enforce the Patman Act strictly would upset all the practices that have been in vogue since the Declaration of Independence was signed and would be a major step in the annulment of that Declaration.

For Fuller and Better Living

Herman W. Richter
Research Director, George O. Jenkins Co.

THE efforts of certain groups to curtail the technical services which are so freely offered to their customers today by most progressive producers of chemicals seem part and parcel of the same economic philosophy that decries increasing use of the machine, rejoices over short crops, and even actively promotes scarcity of commodities.

It is, of course, undeniable that the smaller chemical companies may find themselves temporarily at a disadvantage, from time to time, because their larger and wealthier competitors are able to render more help to the consumer than they can. But it can be argued that the entire chemical industry is stimulated by the efforts of our major producers to introduce their wares to industry. Consider, for example, the tremendous developments of the past decade in the realm of solvents and plasticizers. A host of new materials has been made available to industry—and can it be said that any one company has a monopoly of the business? A glance through the advertising pages of CHEMICAL INDUSTRIES supplies the answer. Far from decreasing opportunity for the smaller producing units, the sales efforts of the larger companies have made industry "new materials conscious." It is a poor research director who does not keep closely in touch with the remarkable new products which are being offered in ever-increasing numbers and which hold so much promise for better living in the years to come.

It is the larger view, it would seem, that we should take in this matter. We must answer for ourselves this question: Will progress be best served by curtailing the promotional activities of well-equipped organizations or by allowing them reasonable independence? It seems to the writer (who, by the way, is no advocate of the policy of *laissez faire* in government and in international relationships) that the answer to this question is obvious. Anything that contributes to the wider and more rapid diffusion of knowledge concerning the properties and adaptability of materials must work

for the good of society as a whole; anything that impedes this process must work to its detriment. Even if we grant that a few small producers may suffer because of the activity of their better-equipped competitors, is that sufficient reason for denying society the undisputed benefits produced by such activity?

Though the writer speaks purely as a consumer who is not in close touch with the problems created by "free" technical service in so far as they affect the small producer, it seems to him that one inevitable result of such competition must be the stimulation of research on the part of the smaller companies. Though they may be unable to offer technical assistance as freely as their competitors they can still seek methods of reducing their costs and improving their products—and we must not lose sight of the fact that price and quality are still, and always will be, effective sales arguments.

One further consideration that should not be overlooked is that there are certain natural checks and balances that prevent gross abuse of the practice of supplying "free" service. On the one hand, the chemical producer must exercise a certain degree of caution in the extent to which he offers such service; while on the other hand we must consider the natural reluctance of reputable manufacturers to accept unlimited aid. In the absence of specific agreements the manufacturer who depends upon free service must run the risk of weakening his position in relation to patents. Many organizations prefer, for this reason, to do their own development work, making only nominal use of the facilities offered them.

To sum up this brief discussion we might say that while it may be wise not to close our minds to legislation which has for its purpose the prevention of gross abuse—if any exists—it would seem distinctly unwise to keep permanently on our statute books any laws that curtail the free and rapid dissemination of information concerning the utility of the materials which, in this modern age, we need for fuller and better living.

Economics of Each Situation Should Dictate

Walter M. Scott

Service Director, Gustavus J. Esselen, Inc.

CERTAIN forms of technical sales service are, of course, not only justifiable but highly desirable from the standpoint of the customer as well as the manufacturer. For example, when an entirely new chemical is developed, it is necessary for the manufacturer to conduct a large amount of application research in order to determine what industries, if any, might be expected to offer reasonable promise of a profitable market. It is then necessary to make the results of these studies available to the potential customers in order to convince them of the desirability of giving this new product a trial in their plant.

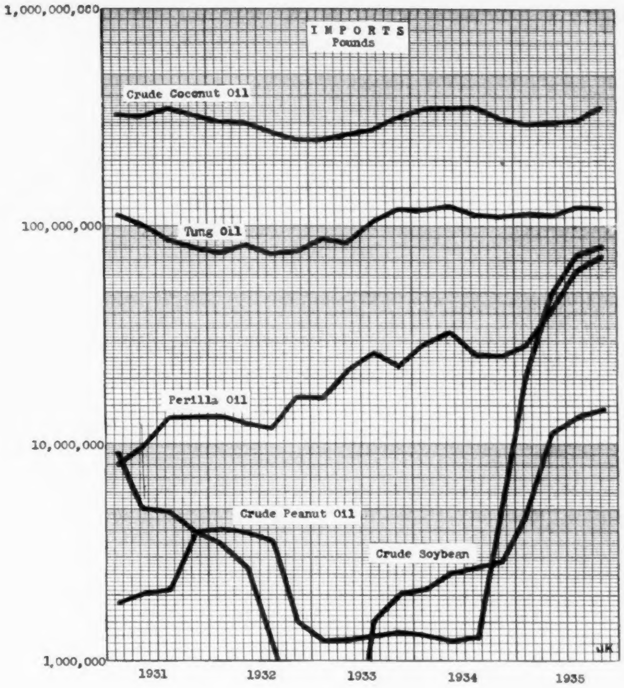
Unfortunately, if the writer's experience in the textile industry is any criterion, the technical service to the customer does not stop with the mere furnishing of information or directions for use. In introducing a new product into the textile industry it is becoming increasingly common for the sales department to send a technical man into the customer's mill and authorize him to spend as many days there as are necessary to establish the process containing the new product on a satisfactory running basis.

This form of sales service may become unduly extravagant in many cases. For example, at the present time many new types of wetting agents are being introduced into the textile industry. Most of these agents are so powerful in their action that only very small amounts are required. Consequently the maximum consumption of these agents in an individual mill may not provide more than a few hundred dollars worth of total sales during a whole year. And yet, a high-salaried technical service man may spend several days in demonstrating to this mill how to use these agents in their processes. The high cost of such service must be met by an increased price for the product paid by every purchaser, whether or not they make use of the service.

Furthermore, the service rendered by the technical demonstrator can not of necessity be as unbiased or as comprehensive as the service given by the customer's own technical organization or by an independent consulting organization. The two latter organizations are in a position to make an unbiased survey of all the possibilities whereas the technical service man is of necessity limited to the products manufactured by his concern. From the standpoint of the consumers their best interests would be served by maintaining their own technical department to pass on the merits of new products and processes. Those whose business does not warrant a technical division could avail themselves of the services of the consulting organization whose broad experience makes them particularly well fitted to render competent advisory service.

The professional technical consultants do not need to fear the competition of the sales service furnished by the manufacturers of chemical products unless this service is carried beyond the bounds of reason as in the instance cited above. In fact, the independent consulting organization can render two distinct services in connection with the large number of new products which are being developed at the present time: (1) To the manufacturer in relieving him of unnecessary and unwarranted selling expenses, or, (2) To the potential customer in giving him unbiased advice about new products.

At first sight, it might seem as though one organization could not render both services. In connection with any one product this would be true, unless that product happened to be of outstanding merit, and then only with a complete understanding between the manufacturer and the potential customer of the dual capacity of the consulting organization. Ordinarily the service would be rendered entirely in the interests of the user.



The American Balance Sheet in Fats and Oils

CAN the United States be made self-sufficient in oils and fats? Like the classical query, "Have you stopped beating your wife?" a simple "yes" or "no" is not a wise answer.

Important, unnatural, complications now beset international trading in oils and fats. Import restrictions by license, by duties, by quotas; restrictions in production; control over payments; difficult barter business; disregard of contracts by governments; currency devaluation; failures of "corners" in raw materials in London, India, and the Far East; failure of the gold bloc; fears of war; sanctions; government-controlled marketing agencies; compensatory taxes; processing taxes, and add to these man-made complications, recurrent floods, droughts, and cyclones—it is a situation that baffles simple analysis.

Current statistics plainly reveal, however, the seriousness of our foreign dependence. We imported 1,152,320 tons in 1935, as against exports of but 107,039 tons, an adverse excess of 1,045,281 tons! While a debit balance has existed each of the past ten years, our present predicament is most extraordinary. Industrial recovery has occurred coincident with diminishing domestic supplies of oils and fats, thereby aggravating the situation tremendously.

The charts in this article were designed to show a complete statistical study graphically of the significant changes in the fats and oils in the last five years and were drawn to be as self-explanatory as possible. All data have been taken from the Bureau of the Census publication, "Animal and Vegetable Fats and Oils."

Semi-logarithmic charts, far less familiar than they deserve, are used throughout, since they provide the only method of representing figures of widely different magnitudes on the same chart. Horizontal rulings are spaced logarithmically, permitting equally faithful presentation of two series in which one is a thousand times greater than the other.

Data for production, consumption, imports, and exports are available for quarterly periods. To make use of all this data and yet prevent irregularities due to seasonal variation, twelve months were plotted, that is, the figure plotted for each quarter represents data for the twelve months ended that quarter.

Charts may be divided into three broad groups. In the first group, comprising production, consumption, imports, and exports, the movement of each oil is comparable with others on the chart so that displacement may be gauged. In the second group, which includes individual oils, changes in trends of consumption and types of outlet for each oil may be judged. Finally, the third group illustrates changing demands for oils and replacements within certain industrial groupings.

U. S. Import-Export Trade Balance (Tons)

	Total Imports	Total Exports	Excess Imports
1926	735,231	467,338	267,893
1927	727,849	463,525	264,324
1928	740,232	475,209	265,023
1929	965,476	493,877	471,599
1930	812,353	404,575	407,778
1931	776,206	376,732	399,474
1932	575,669	383,150	192,519
1933	788,228	373,775	414,453
1934	662,316	279,087	383,229
1935	1,152,320	107,039	1,045,281

Drought in 1934 and the palliatives initiated in Washington to relieve the farmer were the two greatest contributing causes to an increase of nearly 300 per cent. in our excess imports in 1935 over 1934. The United States has always been the outstanding

producer of cottonseed oil and tallow; in the past year this position was completely reversed. We have been dominating the international markets, but in the unenviable role of the biggest buyer not as the controlling seller.

In 1935 we had to buy 74,413 tons of cotton oil abroad, as compared with but 4,087 tons in 1934 and none in 1933. In 1935 we brought in 109,755 tons of tallow, compared with 19,177 tons in 1934 and but 106 tons in 1933. On the other side, we exported only 1,704 tons of cotton oil in 1935, as against 6,637 tons in 1934 and 15,778 tons in 1933. Lard exports last year were only 43,016 tons compared with 192,517 tons in 1934 and 258,512 tons in 1933.

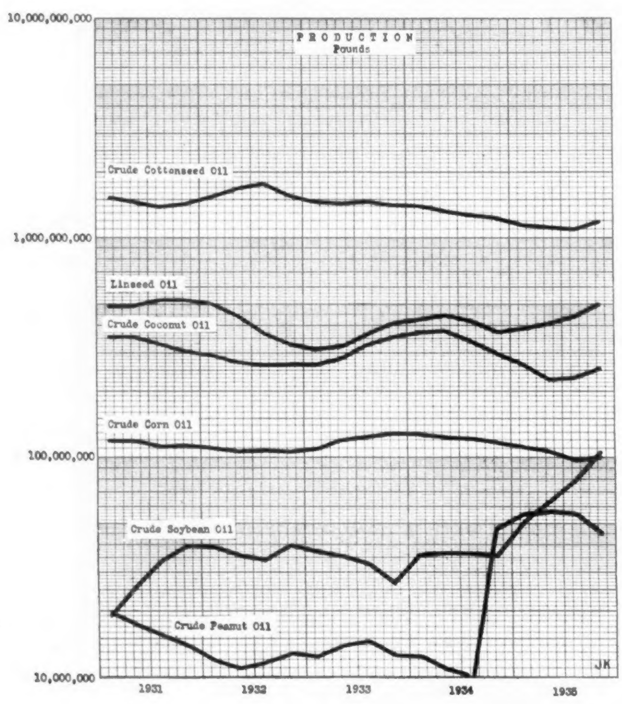
The import-export position between 1900 and 1924 illustrates dramatically the degree of present dependence. Until 1916 our foreign trade in all fatty oils showed a heavy export balance. Owing to war-time demands, imports of vegetable oils expanded greatly, and during the years 1917-1920 imports exceeded exports. In 1921 we had a temporary revival of large exports. But in 1922-1924, imports and exports struck practically a balance. During boom and depression, from 1926-34, we imported on the average one-third of a million tons of fatty oils. Last year this excess jumped to over one million tons and this stupendous import excess will certainly not be cut down very materially during this year, if at all.

Oils and Fats Imports Into the U. S. (In Tons)*

(Oil Equivalent of Seeds, Nuts, and Kernels; Tallow, Oils, Fats, Etc.)

	1930	1931	1932	1933	1934	1935
Palm Kernels	....	6,597	5,765	2,997	1,709	10,058
Flaxseed	98,133	112,223	62,301	107,007	109,817	136,087
Copra	174,206	131,997	131,576	191,770	115,848	131,779
Castor Beans	18,403	18,431	14,849	20,196	16,578	13,758
Sesame Seed	none or not given	none or not given	none or not given	9,705	5,082	33,600
Poppy Seed	none or not given	none or not given	none or not given	1,772	1,373	1,776
Rapeseed	none or not given	none or not given	none or not given	2,250	1,540	4,874
Other Oil Seeds	not given	not given	not given	799	4,126	19,878
China Wood Oil	60,075	35,407	33,893	53,018	49,012	53,548
Coconut Oil	137,929	145,178	111,213	141,106	140,054	157,766
Linseed Oil	963	105	11	5,025	1,234	996
Olive Oil (Edible)	57,221	31,424	33,158	32,127	25,000	32,048
Olive Oil (Inedible)	3,157	5,377	5,250	5,763	4,342	8,814
Palm Oil	128,791	114,924	96,950	128,340	69,433	132,366
Palm Kernel Oil	16,670	11,321	946	5,794	5,693	26,146
Peanut Oil	5,281	922	665	588	1,215	35,948
Sunflower Seed Oil	none or not given	none or not given	none or not given	10,647	8,460	16,541
Rapeseed Oil	3,629	4,694	3,245	5,335	7,422	26,918
Soy Bean Oil	3,629	2,195	180	1,639	1,216	6,360
Perilla Oil	not given	not given	not given	10,168	11,234	32,289
Cottonseed Oil	....	....	....	....	4,087	74,413
Corn Oil	none or not given	none or not given	none or not given	4,093	4,768	11,493
All Other Vegetable Oils	10,951	6,359	5,974	4,010	7,908	19,533
Cod and Cod Liver Oils	16,569	11,472	15,200	18,575	16,503	24,396
Other Fish and Whale Oils	44,419	73,199	5,568	3,025	10,346	11,122
Tallow	251	728	223	106	19,177	109,755
Oleo Stearine	27,939	16,483	20,495	not given	not given	not given
Stearic Acid	not given	not given	not given	2,356	968	2,458
Olive Oil Foots	27,939	16,483	20,495	18,046	16,119	15,088
Wool Grease	3,528	1,968	1,782	1,971	2,052	2,512
Total of Imports	**812,353**	**731,903**	**549,527**	**788,228**	**662,316**	**1,152,320**

* Taken from the annual reports of Faure, Blattman & Co. for 1930-34; known as H. M. F. Faure & Co., since 1935, London, England.



A cotton crop of 12 to 13 million bales ($3\frac{1}{4}$ million barrels of refined oil) covers our normal oil requirements. We have failed by a wide margin to reach the minimum in each of the last three years—1934-35, 9,731,000 bales; 1935-36, 10,734,000 bales; 1936-37, 11,609,000 bales (the last according to the October Government Crop Report). Since 1934 we have been "short" approximately 7,000,000 bales of cotton ($1\frac{3}{4}$ million barrels of oil). To make the loss perfectly clear, the average crop for the 1934-37 period reached but 10,717,000 bales, against an average of 13,089,578 bales for the 1914-34 period.

Direct statistics for crude cotton oil production even more forcibly indicate our predicament:

	Production (barrels)*	Exports (barrels)
1928	3,651,086	104,250
1929	3,954,087	65,187
1930	4,086,394	70,741
1931	3,543,065	56,444
1932	3,929,597	139,395
1933	3,494,875	91,125
1934	3,058,800	37,175
1935	2,957,225	9,550

* Barrels of 400 lbs. each.

Successive years of lowered production have had four repercussions: first, a trend away from cotton oil to other fats and oils; second, a decline in cotton oil

Fats and Oils Exports from the U. S. (In Tons)*

(Oil Equivalent of Seeds, Nuts, and Kernels; Tallow, Oils, Fats, Etc.)

	1930	1931	1932	1933	1934	1935
Copra	2,122	8,872	4,721	2,587	3,297	3,924
Other Oil Seeds	....	....	....	3,186	776	12,448
China Wood Oil	2,515	2,073	1,486	1,890	2,355	2,198
Cotton Oil	12,235	10,077	24,895	15,778	6,637	1,704
Coconut Oil	12,054	8,572	12,108	13,291	12,557	6,475
Linseed Oil	705	487	376	368	292	440
Olive Oil (Edible)	74	48	25	20	14	121
Palm and Palm Kernel Oil	389	852	1,131	2,105	617	5,385
Peanut Oil	15	330	....	....	....	318
Soy Bean Oil	2,306	2,465	1,202	700	911	2,145
Corn Oil	274	346	428	457	586	371
Other Vegetable Oils and Fats	3,816	5,497	1,844	1,246	2,096	2,284
All Other Fish and Animal Oils	2,224	1,851	7,142	5,279	4,265	5,455
Oleo Stock	3,473	3,537	3,159	3,854	2,667	1,507
Tallow	2,481	1,208	1,121	3,066	3,278	239
Lard	286,811	253,880	243,832	258,512	192,517	43,016
Oleo Oil	25,218	21,126	18,933	1,161	974	544
Oleo Stearine	1,819	3,054	3,361	2,800	1,899	563
Neutral Lard	6,040	4,280	2,658	2,279	1,632	448
Other Greases (Including Soap Stock)	35,759	44,659	34,228	39,998	32,306	13,267
Margarine	309	244	213	128	164	57
Lard Compound	3,936	2,679	1,559	1,161	974	544
Soy Beans	....	595	18,705	not given	not given	not given
Total	**404,575**	**376,732**	**383,127**	**373,775**	**279,087**	**107,039**

* Taken from the annual reports of H. M. F. Faure & Co., London, England.

exports; third, a rise in imports; fourth, a decline in the carry-over. At the close of the 1933-34 season the carry-over was 1,881,544 barrels. At the close of the 1934-35 season it had been reduced to 1,116,603, while at the close of the 1935-36 season it was well below a million barrels. The Bankhead Cotton Restriction Act and, to a lesser extent, drought directly caused this situation.

The 1934 drought resulted in the smallest corn crop on record, and, perhaps, the current crop just misses another new low record, caused again by abnormally low rainfall in the corn-producing states. A small corn crop means low hog feeding operations, higher pork prices, and smaller lard production.

Lard in the United States (Tons)

	Production	Consumption	Exports
1931	693,758	435,598	258,160
1932	702,437	455,947	246,490
1933	792,228	531,437	260,791
1934	608,817	414,668	194,149
1935	295,535	252,071	43,464

A sharp rise in imports of tallow and grease has naturally been recorded in 1935. Cattle slaughtered because of ruined grazing did raise our supplies of animal fats temporarily, but it will take two years at least to make up this deficit and, meanwhile, we must depend heavily on imports:

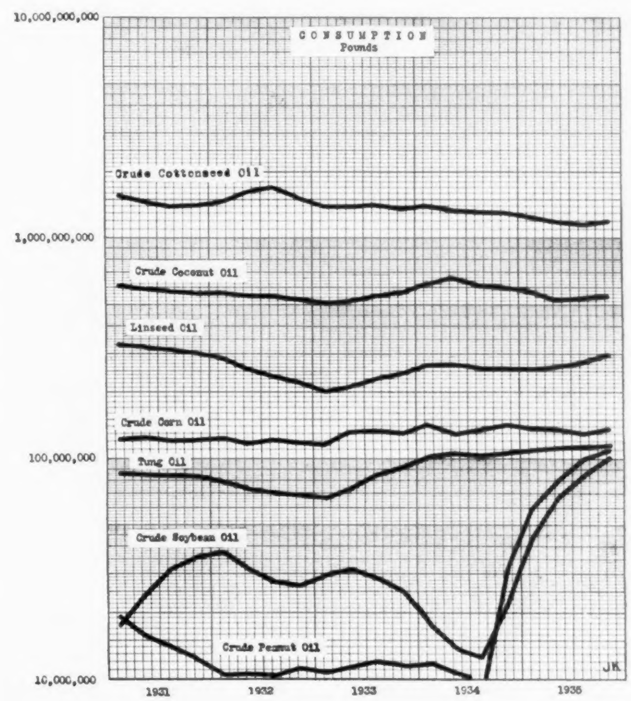
Imports of Tallow and Grease (In Tons)

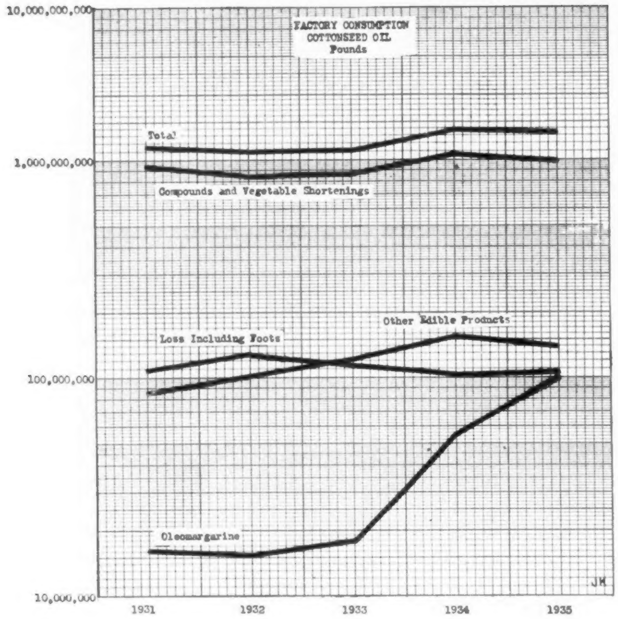
	Tallow	Grease
1930	251	3,528
1931	728	1,968
1932	223	1,782
1933	106	1,971
1934	19,177	2,052
1935	109,755	2,512

Before self-sufficiency our pressing problem is sufficient supplies, irregardless of origin. Because of these shortages we had the choice of tightening our belts early in 1935 or purchasing the world's surplus stocks accumulated during the depression. To make matters worse consumption of oils and fats during 1935 reached 51 pounds per capita against 46 pounds in 1933, which for 125 million people means an increased consumption of 279,017 tons. We chose to turn buyer in a large way, and in 18 months have practically cleaned out the world's surplus. Our big imports turned the fats and oils prices upwards after nearly five years of almost uninterrupted declines. Foreign countries have actually gone on "short rations" of oils and fats attracted by the lucrative markets in the United States.

Further to aggravate a serious situation the Compensatory Tax Law of 1935 and in 1936 duties on several oils hitherto untaxed have disarranged the normal price relationship of the principal vegetable oils, creating unexpected strains on the world markets, forcing consumers to substitutions never before attempted.

The interchangeability of fats and oils is misunderstood by many. Were all completely, indiscriminately interchangeable the problem of attaining self-sufficiency would indeed be simple. Merely increase the production of oils and fats now produced domestically to meet all domestic requirements, and perhaps, for good measure, create a large and profitable exportable surplus



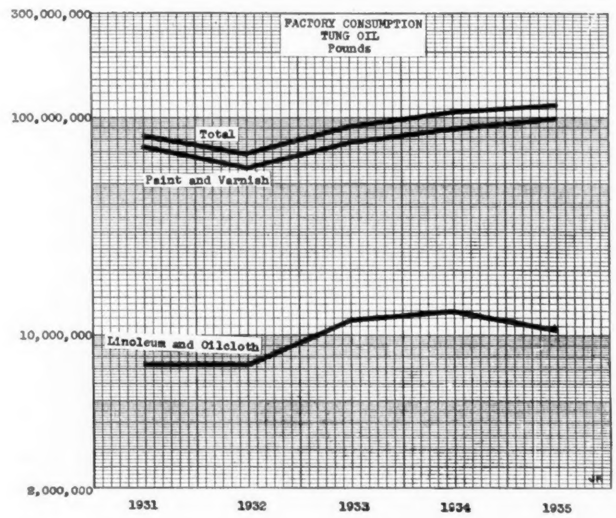


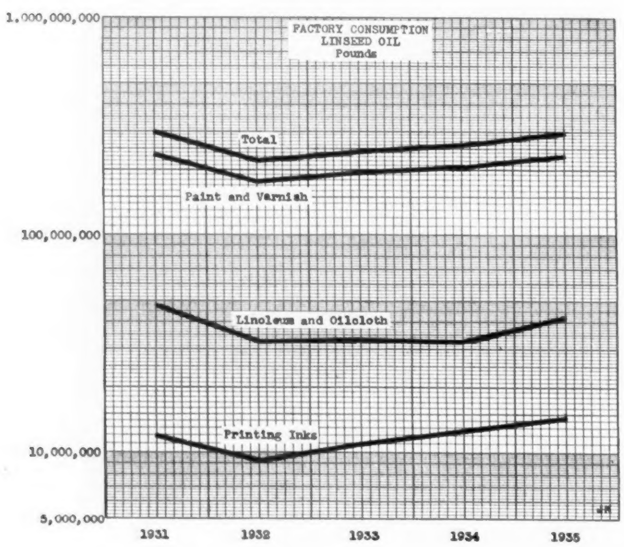
and the goal is won. A highly desirable objective to be sure, but one that unfortunately cannot be achieved quite so simply. True, through hydrogenation possible interchangeability has been widened, but neither that process, nor any other, has been so perfected that it permits wholesale substitution.

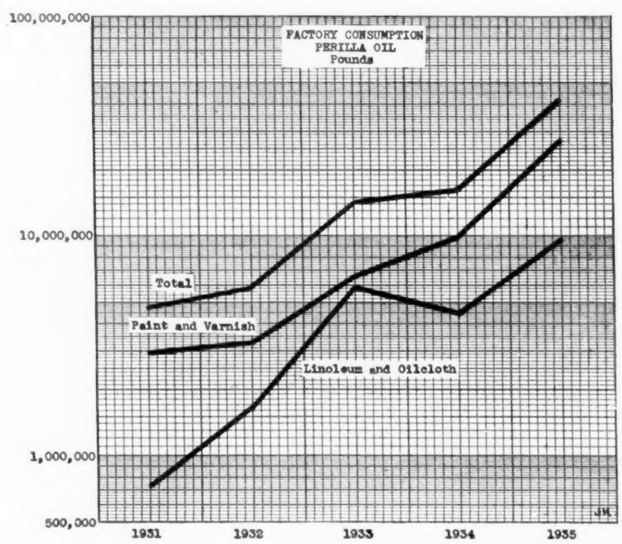
Animal and vegetable oils and fats have individual properties and characteristics and are not equally suitable for all purposes. The limitations are perfectly understood by the users and they pick and choose on the basis of adaptability, price, and availability. Thence the possibilities of future self-sufficiency cannot be considered solely from the angle of total domestic consumption against total possible domestic production. Each important fat and oil must be judged separately with careful regard to the degrees of interchangeability that exist in its practical uses. Moreover, self-sufficiency in peace is quite different from self-sufficiency in war. Stark necessity breaks down all normal employment of various oils. German war history proves this fact conclusively. A soap that may be rancid is certainly better than no soap at all. But in this discussion self-sufficiency under normal conditions is assumed to be the ultimate goal.

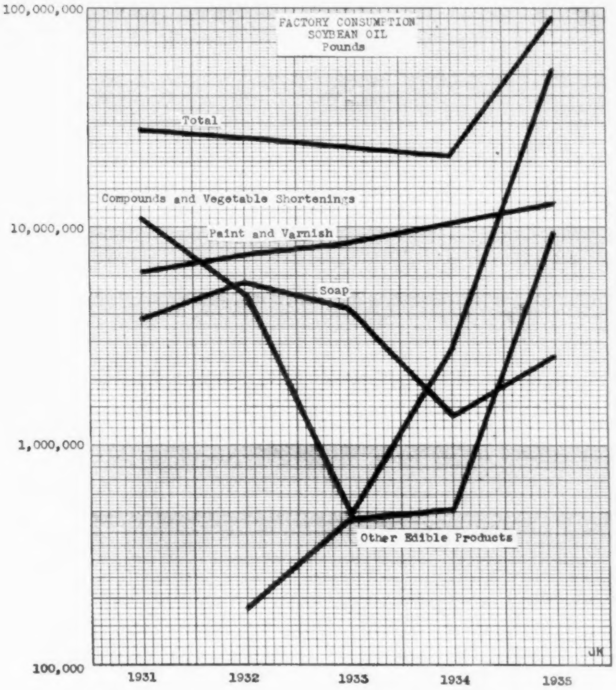
One school of meteorologists believes that a plague of recurring drought conditions and with greater frequency than in the past, will result in the ruthless destruction of large areas of our agricultural lands, but such assumption is largely theory not substantiated so that we must accept such conditions as inevitable. Hence a fairly safe assumption is that with a normal rainfall we will return to the former satisfactory position in lard and other animal oils and fats. Already lard stocks are double those of a year ago and again up to the five-year average. The lag in increased production of beef animal oils and fats must necessarily be greater than in lard and is easily understandable.

The outlook is not so promising for the vegetable oils. Factory consumption establishes the relative importance of the oils and fats, at least in volume of consumption, but several of the lesser-used oils are vital and irreplaceable in certain of their uses.







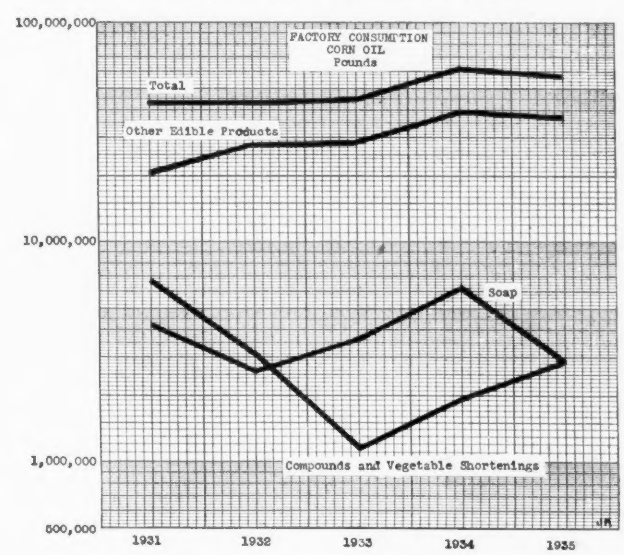


Factory Consumption of Oils and Fats*

(Quantities in Thousands of Pounds)

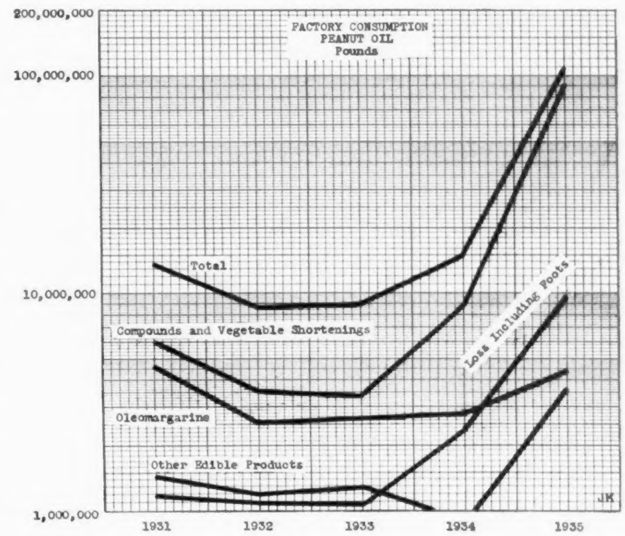
Kind	1931	1932	1933	1934	1935
Cottonseed oil..	1,140,799	1,083,959	1,114,846	1,377,437	1,333,739
Peanut oil	13,543	8,608	8,872	14,999	109,378
Coconut oil	593,684	549,515	583,826	589,602	582,097
Corn oil	42,819	42,414	43,946	61,094	56,121
Soybean oil	27,885	25,269	22,958	20,907	91,166
Olive oil, edible..	2,003	1,711	2,139	2,372	2,432
Olive oil, inedible	7,482	6,383	10,217	8,975	10,703
Olive foots	39,676	31,474	32,970	30,738	31,860
Palm kernel oil.	54,059	16,615	15,962	22,601	57,025
Rapeseed oil ...	8,782	6,448	7,698	10,366	35,802
Linseed oil	298,773	219,746	241,325	258,483	291,684
China wood oil..	82,314	67,948	91,549	105,978	114,287
Vegetable tallow	3,256	511	14,186	not given	not given
Castor oil	17,024	14,737	19,486	20,188	25,762
Palm oil	235,585	208,547	232,619	191,738	251,393
Sesame oil	44,778	10,514	13,834	7,403	54,252
Perilla oil	4,722	5,808	13,885	16,108	41,609
Other vegetable oils	21,094	9,205	2,021	5,479	29,680
Lard	22,277	19,340	17,485	14,260	9,429
Edible animal stearin	33,144	24,251	25,421	28,703	34,161
Oleo oil	31,371	15,765	19,061	26,137	18,620
Tallow, edible ..	71,885	48,555	51,447	78,909	124,882
Tallow, inedible.	566,328	585,896	566,731	717,368	718,357
Grease	210,754	202,860	205,520	240,154	200,222
Neat's foot oil ..	5,093	3,817	4,280	4,561	6,626
Marine animal oils	72,606	51,974	46,110	35,207	30,963
Fish oils	120,733	93,685	106,247	126,480	219,635
Total	**3,771,469**	**3,355,555**	**3,514,641**	**4,028,003**	**4,494,287**

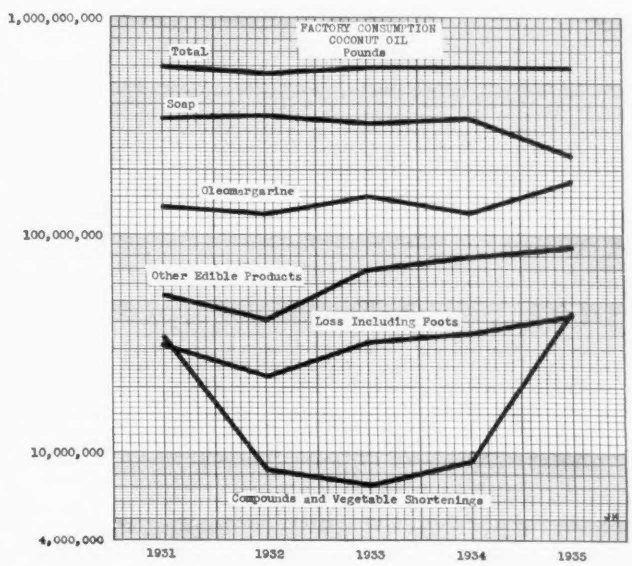
* From the annual reports of the Bureau of the Census.



The largest oil consumption is that of cottonseed, approximately one-fourth of the total factory consumption. A byproduct of cotton, we can only be certain of adequate supplies of oil if and when: 1. Governmental restriction schemes are permanently abandoned; 2. A series of cotton crops undiminished by drought or extensive insect injury are picked; 3. Foreign markets are found for cotton fibre we cannot consume domestically. Number 1 is, of course, highly speculative, because both political parties are committed to tinkering with the law of supply and demand in agriculture. Number 3 depends upon the competition American cotton encounters from foreign-grown in world markets, since we no longer enjoy a tight monopoly.

Normal domestic consumption is about 7 million bales, and this figure will probably be reached this year. In 1934, 6 million bales were exported and this year we very likely will export 5 million. A regular home consumption of 7 million bales and sales abroad of 6 million would allow a minimum domestic production of about 13,000,000 bales sufficient to supply our normal requirements of oil.





Coconut oil is second in volume of consumption. With the Philippines we were economically self-sufficient, but the Islands have been granted complete independence within the next decade. Quite useless is speculation as to what will happen. If the transfer of some 26 millions of dollars, collected by the three cent processing tax on coconut, into the coffers of the Philippine Government, is any indication, the users of coconut oil can hardly hope that Congress will approach future trade agreements with the Islands with a proper regard for consumer's interests, although the Independence Bill provides for free importation of 448,000,000 pounds annually.

The processing tax on coconut oil was passed at the insistence of the agricultural and dairy elements in Congress to create increased markets for cotton oil and tallow, and check margarine production. Proponents of the measure insisted that coconut enjoyed undue advantage against home-grown fats and oils which were subjected to processing taxes. No one has demonstrated even the remotest possibility of the establishment of domestic sources of the raw material. The consumption records of the past 18 months prove that other oils cannot be substituted in a major way for coconut. The soap producers, who normally consume approximately 65 per cent. of the importations, continued to use large quantities, despite the higher cost, for substitution adversely affects the type, appearance, and physical properties of their products. This they dare not risk. And, what is true in soap production, is largely true of the other coconut oil consuming industries.

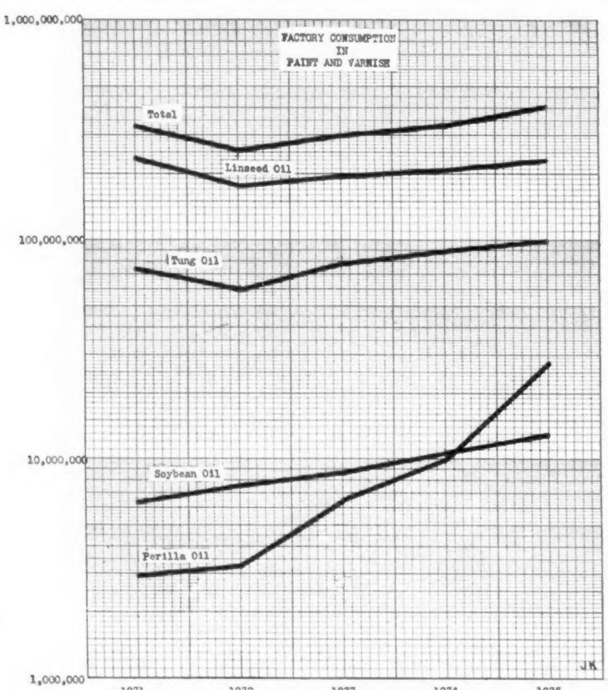
Third in consumption is linseed. Under so-called normal conditions domestic flaxseed has supplied somewhat less than half of our requirements, the balance is imported largely from the Argentine. Increased domestic flaxseed acreage is, of course, a possibility, but certainly it could only be done with some form of artificial stimulation, financial or otherwise.

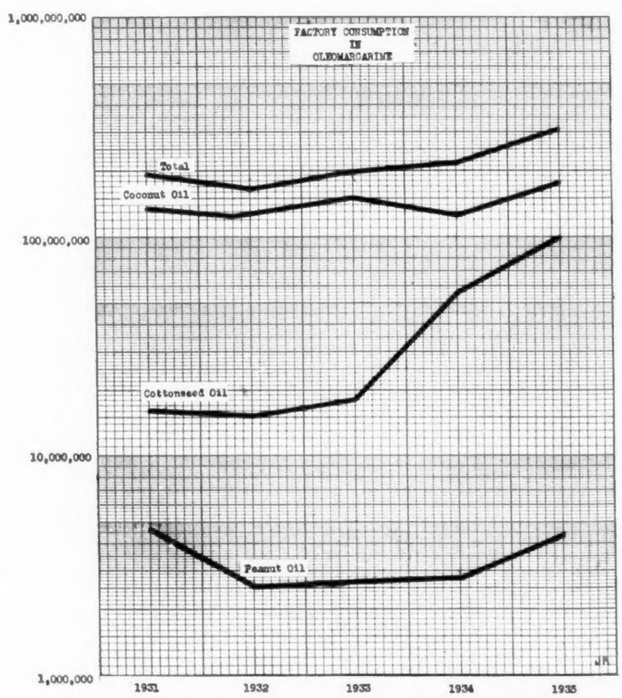
For several years now, palm oil has been in fourth position in factory consumption. We have no domestic sources and cannot develop any. Imports increased 91 per cent. in 1935 over 1934, from 69,433 to 132,366 tons. We required approximately two-thirds of the Netherland-Indian 1935 exports. The abnormal rise was largely due to the demand for edible oils to replenish the shortage of cotton oil and lard. The increase is thus not representative of future trends, since 1934 imports were abnormally small, due to the processing taxes, and 1935 imports, with the processing taxes in force, were actually 4,026 tons more than those of 1933, when there were no taxes, and 3,575 tons more than the previous record year of 1930.

Proponents of self-sufficiency take encouragement from the efforts to develop domestic soybean and tung oil sources, although in the latter we have made but a very modest, but withal an auspicious beginning.

At least 50 per cent. of all quick-drying coating compositions, including clear and pigmented finishes, contain tung oil. In some cases the tung oil content combined with other flexibilizing oils is 80 per cent. The modern tendency in the paint field is to combine tung with other oils such as soybean, fish, perilla, and linseed. When the price soared abnormally high, attempts to find less costly substitutes were given greater attention. One fairly satisfactory substitute, oiticica, was found, but this is Brazilian not American in origin. Tung oil during the past two years has demonstrated that interchangeability can only be practiced within relatively narrow limits. Else its consumption would have shrunk during the period of abnormally high prices.

C. C. Concannon told the Gulf Coast Chemurgic Conference on October 20th at Pensacola, Fla., that





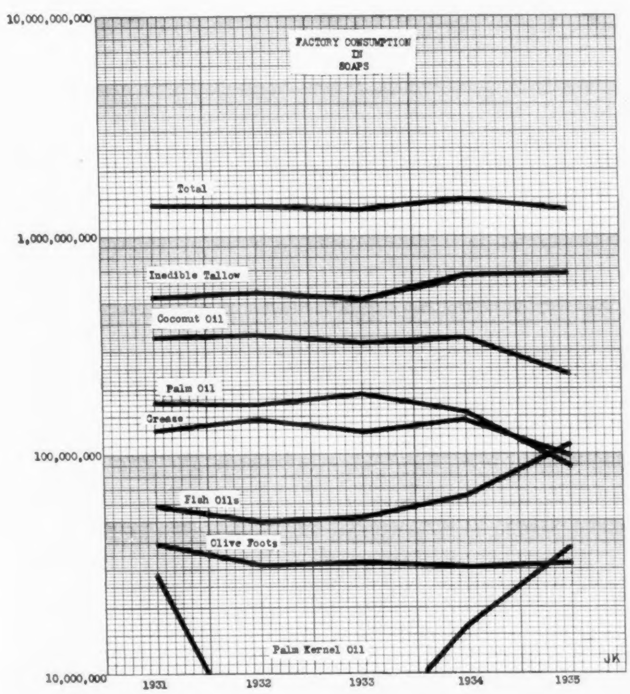
the 1936 domestic crop of tung is not less than 2,000,000 pounds. This is one-sixtieth of our requirements. Imports have exceeded 110,000,000 pounds in recent years with one exception, 1931, when but 79,300,000 pounds were imported. In '35, despite a high of 40 cents per lb. and an average of about 18 cents, we imported 120,100,000 pounds.

The tung tree requires five years to come into commercial production and a fair average crop from mature trees is probably about a 1000 lbs. of oil per acre. Accordingly self-sufficiency in tung oil must be classified as a long-term possibility. Indeed Dr. Concannon estimates the demand could not be met by local growers within 25 years, if all acres suitable for such growth were put under immediate cultivation.

For practical purposes complete self-sufficiency in tung, or any other imported oil, is not necessary, and may not even be desirable. A sizable crop would, however, assist materially in preventing such a runaway market as last year in tung oil or any possibility of a controlled market as recently set up for flaxseed in the Argentine and by the Chinese authorities in tung oil.

Our best record has been made in soybean. Domestic acreages have been expanded tremendously during the past few years. During the latter half of 1935 we actually became an exporter of 39,246 long tons of oil while imports were but slightly over 6,000 tons. Factory consumption in 1935 amounted to 50,450 tons, so that we are well on the way to self-sufficiency. The outlook for even greater production is bright, stimulated by new uses, notably in plastics, and the direct interest that Henry Ford and others have exhibited in fostering soybeans as a major crop with the American farmer.

The present situation and the future possibilities of



the remaining oils can be briefly summarized as follows:

Corn Oil. Except when drought causes unusually small corn yields, we are already self-sufficient and could increase production to a point where large supplies of corn oil would be available for substitution for foreign-produced oils within the limits of interchangeability.

Peanut Oil. At a satisfactory price we come reasonably close to self-sufficiency, and could extend, if circumstances warranted, the crushing operations of the normal peanut crop which in this country is not produced primarily for oil. Usually only the culls and seconds go to the crushers.

Perilla is fast becoming important in drying-oil mixtures in paints. Over the past few years, because of price consideration, it has substituted to a certain extent for linseed. Recorded consumption has increased from 4,700,000 pounds in 1931 to 16,100,000 pounds in '34 and 41,600,000 pounds in '35. Imports rose from 13,300,000 pounds in '31 to 25,200,000 pounds in 1934 and 72,300,000 pounds in 1935. Attempts are in progress to introduce a domestic crop, but so far the efforts are very feeble.

Rapeseed oil assumed sudden importance in 1935 when it was excluded from the processing and compensatory taxes. Imports reached 53,836,000 pounds. More nearly normal were the 1934 imports of 15,800,000 pounds and more nearly representative of the requirements for which rapeseed cannot be substituted with any other oil. At present we have no domestic production of rapeseed oil, sesame oil, olive oil, or olive oil foots from domestically grown raw materials. Yet all are essential in industry, and while subject to minor substitutions by other oils, a complete cessation of supplies would prove embarrassing.

A simple yes or no will not suffice to answer, "Can we become self-contained in oils and fats?" Certainly our dependence the last two years was abnormal and unlikely to continue. For several oils the likelihood of self-sufficiency is extremely doubtful. Problems of climate, cheap labor, and available acreages are but a few of the obstacles. But there is always the possibility that we can discover new raw materials providing oils capable of perfect substitution.

Will the American public countenance direct subsidies to foster increased oils and fats production? Hardly, unless such grants are disguised in the form of tariff increases, and even then such aid would be violently protested by many, and probably could not be obtained at all. The present administration is little interested in the theory of self-sufficiency; under the leadership of Secretary of State Hull it stands committed to negotiating two-way tariff pacts. Despite the passage of heavy taxes on foreign oils in 1935 and again in 1936 the administration generally does not favor high protection.

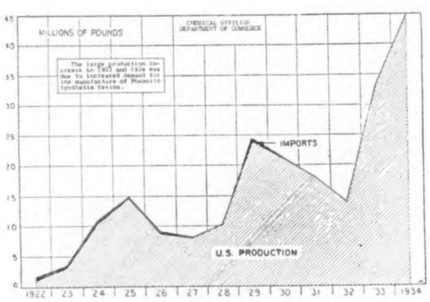
Nevertheless, progress towards self-sufficiency will be inevitably achieved over the next few decades. The

new Farm Chemurgic Movement is focusing public attention not only to the desirability of much wider diversification of farm crops but to the practicability of producing on the farm many of the raw materials for industry. From quite a different quarter self-sufficiency may come through technological advances, not now foreseen. An inkling of what yet may be the final answer is the recent report from Dr. Charles H. Herty that he has succeeded in recovering from pine and spruce trees fats suitable for use in the soap kettle and in ore flotation processes. He has found that the tree fats are similar in character to animal fats and so capable of substitution to certain degrees yet undetermined. In Germany within the past few months they are oxidizing the so-called Fischer oils from coal distillation to the point where they are suitable for soap-making. A plant has been erected by the German Sebaceous Acid Works at Witten-am-Ruhr to operate the process.

Possibly the solution of independence in oils and fats lies below the ground, not above it.

Independence In Phenol

Phenol, unlike either naphthalene or cresylic acid, has maintained a remarkable price stability, published quotations showing but a half a cent decline between 1929 and 1932 and holding at the 14¼ cent level through the 1932 - 1936 period. Another point of dissimilarity is our independence of foreign phenol supplies.



Expanding plastics industry is largely responsible for the increase in phenol production.

Phenol is produced in two ways: 1 — Recovery from certain fractions in the distillation of either coal gas or coke in by-product ovens. Previous to the World War our entire production (but 1,000,000 pounds) was derived from this source and in England today it is the only large commercial source. 2—Chemical treatment of benzol (itself a by-product of the coal-gas and by-product-coke industry) by either of two ways. Phenol thus produced is referred to as "synthetic," and our domestic supply since the war has been largely obtained from both of these processes. A third but smaller source at the present time, but one with future possibilities, is the recovery of phenol by several different methods from waste liquors from ammonia distillation. Production from such waste liquors has largely been initiated to prevent stream pollution, not primarily as a leading source of phenol production. Dr. Jules Bebie has estimated that if the liquor of the 15,000 domestic by-product coke ovens were treated by a method similar to that employed at the extraction plant at Fairmont, W. Va., a production of 56,000,000 pounds of crude, or 25,000,000 pounds of pure could be obtained. There is, too, the possibility of the future development in this country of low-temperature coal carbonization plants where the phenolic content of the tar is much higher than in coal tar derived from by-product coke. Low temperature carbonization technique has advanced faster in England and on the Continent than in the U. S. Despite a discouraging start in this country the future development of such processes may radically change the chemico-economic status now existing in the coal tar chemical industry. Newspaper releases of but a few days past disclosed plans for a $600,000 coal carbonization plant to be built at Belleville, Ill., across the Mississippi River from St. Louis. This may be the forerunner of others.

Finally, the tremendous expansion in the production of coal tar resins has given a lift to the producers of phenol from by-product tar, for the crude phenol obtained in this way is directly applicable to the manufacture of certain types of resins.

Fortunate then is the position of this country on the matter of phenol supplies. The shortage which stirred up such tremendous interest a few years back was largely due to a sudden rise in exports, principally to Japan, and was but a temporary and unusual situation. Much of the steady increase year by year in the consumption of phenol is caused by the growth in the use of phenolic plastics. While these must now share the plastics field with resins and plastics of other origins in increasing proportions, nevertheless no one seriously believes that the phenol-formaldehyde types have reached a peak in their utilization and production.

Industry's Bookshelf

The Atom by N. Da C. Andrade, 129 pp., Nelson, 60c.

Clear, simple, sound—best brief popular exposition of fact and modern theory revised and brought to date.

Materials of Medieval Painting by Daniel V. Thompson, Jr., 239 pp., Yale University Press, $2.50.

A fascinating survey of materials and technical methods packed with information of interest to any chemist and of real suggestive value to those working in the fields of dyes, colors, pigments, varnish, and synthetic lacquers.

Carbon Dioxide by Elton L. Quinn and Charles L. Jones, 294 pp., Reinhold, $7.50.

From Pliny's first recorded recognition of *spiritus lethales* to the latest commercial application of Solid CO_2, this notable addition to the A. C. S. Monograph Series treats the chemistry of the physical properties, the manufacture, and the uses of CO_2 in detail. The heterogeneous material is well organized and presented with exceptional clarity and exactitude, and the sections on production and uses and the patent lists are of outstanding merit.

Income and Economic Progress by Harold G. Moulton, 165 pp., National Home Library Foundation, Washington, D. C., 25c.

Advantage ought to be taken of the fact that this, the fourth of the Brookings Institute studies on wealth and progress, is made available in cloth binding at a ridiculously low price, for it is a readable, sensible exposition of sound economic ideas that ought to be placed in many hands. It is not a primer and is not written down to the Pop-eye level, but thousands of intelligent Americans should read it, for it frankly faces modern problems and fully discusses modern economic and legislative trends.

Corrosion Resistance of Metals and Alloys by Robert J. McKay and Robert Worthington, 492 pp., Reinhold Publishing, $7.

Another fine A.C.S. monograph, summarizing facts on corrosion processes and rates. Little attempt is made to solve the problems of corrosion but definite advances that have been made in combating this waste have been well summarized in the text.

Urea-Formaldehyde Synthetic Resins

By A. E. Williams, F. C. S.

THERE are now two chief methods in use for the commercial production of urea. In one of these methods ammonium carbamate is the raw material; by heating this under carefully controlled conditions of temperature and pressure it decomposes into water and urea. The other method makes use of calcium cyanamide, which is hydrolyzed to produce lime and urea; the lime being afterwards precipitated with CO_2 at about 30° C. and the carbonate removed by filtration. This latter method has led to the discovery that it is possible to make urea resins direct from the cyanamide by reaction with formaldehyde. Briefly, the process consists of boiling powdered calcium cyanamide in water until a strong solution is formed. A period of settling then follows to bring down all insoluble matter. The clear solution—consisting principally of cyanamide, di-cyanamide, urea and calcium carbamate—is next agitated in the cold with either acetic or phosphoric acid to precipitate further impurities, when it is strengthened by evaporation before condensing with formaldehyde. Generally, however, the resins produced in this process are inferior to those resulting from urea itself; and as a consequence modern developments are mostly concerned with resins of the latter class.

The widely varying characteristics and properties of urea resins found in commerce are due to different catalysts or condensing agents employed in the condensation process, and also to the relative proportions of urea-formaldehyde employed. The simplest resinous material of this character is prepared by boiling together one part of urea with four parts of formaldehyde without any condensing agent, which produces a weak aqueous solution of the resin. After concentration to a thick viscosity this solution may be used direct as an adhesive. Upon drying the solution at 100° C., however, the solid mass obtained becomes insoluble in water, but is only with difficulty rendered infusible and suitable for use in molding. If the above proportions of urea and formaldehyde are boiled together in the presence of a little acid, such as acetic or formic acid, the primary product obtained is methylene urea ($C_2H_4ON_2$), which lends itself readily to polymerization processes. A resin produced in this manner may be used in varnish manufacture; or, with a filler, for molding purposes.

When the acetic or formic acid is replaced by carbolic acid (phenol) the resulting resin is of special value for transparent varnish making, and in an appropriate solvent gives a film both lasting and durable. The condensation of urea with acrolein also gives a material of value in both varnish and adhesives manufacture, but the difficulty of obtaining cheap acrolein hinders the development of the product commercially. Because of this, investigations are being made with acrolein production from the oil and fat glycerides in the spent carbons and earths of oil refineries.

If urea is heated with 8 to 10 parts of formaldehyde the chief product formed has the composition $C_{11}H_{10}N_8O_7$ and is of little value for either varnish making or molding purposes. In the presence of a small proportion of a mineral acid, such as hydrochloric acid, however, an insoluble and nearly colorless precipitate is formed, having the formula $C_5H_{10}N_4O_3$, which is inert to many chemical substances and from which may be prepared varnishes of special value, owing to their high dielectric strength, in the electrical industries. This illustrates the effect of an acid condensing agent on the composition of the primary condensation product.

In an alkaline basic medium, such as ammonia, calcium hydroxide, etc., urea and formaldehyde give, in the first place, a mixture of monomethylol-urea ($HO.CH_2.NH.CO.NH_2$) and dimethylol-urea, ($HO.CH_2NH.CO.NH.CH_2OH$), the proportions of these depending on the temperature of reaction as well as upon the percentage of urea and formaldehyde used. These two compounds are capable of further condensation and polymerization.

In practice these basic condensing agents are generally found to be the most suitable because they facilitate the formation of the methylol ureas without excessive liberation of water which has to be cleared at a later stage. For the production of a resin of this type, as generally used for molding purposes, one part of urea is boiled with 8 to 10 parts of 40 per cent. formaldehyde, and from 1 to 2 per cent. of calcium hydroxide in aqueous solution for 1 to 2 hours and until a colorless clear solution is obtained. To this solution is added about ½ per cent. of the hydrogenated solvent hexaline, which acts as a homogenizer and to prevent premature gelatinization of the solution during its subsequent concentration. The bulk of the water is next removed by evaporation of the solution under a high vacuum and at a temperature as low as possible. This concentration of the solution may conveniently be performed in two stages, the first in a film evaporator and the second in a vacuum pan. A thick liquor is obtained at the end of the first stage which is usually on the acid side. When acidity is present it must be exactly neutralized by agitating the liquor with ammonia or a strong lime solution. Salt is next added to bring down colloidal and insoluble matter present, after which the liquor is allowed to settle at least several hours before the final evaporation. This may be carried on until a concentration of 70 to 80 per cent. is obtained, which gives a thick liquor while hot and a semi-solid mass when cooled down. The mass is then loaded with fillers, and/or combined with other resins before molding; alternatively, it may be molded and hardened alone, in which case the temperatures under 100° C. are the most suitable.

When the resin is molded and hardened without fillers or other additions the molded product varies from a semi-transparent to a practically clear glassy material. The cloudy mottled varieties are much in use for cheap jewelry manufacture, and fine imitations of opal stones are now made from these. Filled resins are converted by molding to the multitudinous uses to which the more familiar Bakelite class of resin is applied. Specially clear varieties of the unfilled resin, when molded, are now known as "organic glass."

The raw materials used for this must be free from iron, because even 0.1 per cent. of iron oxide is sufficient to discolor the material. For this reason the various processes of manufacture must be carried out in non-ferrous vessels. To a certain extent the tendency to a yellow color in the resin is counteracted by adding a small percentage of copper sulfate if the finished material is for non-electrical purposes. The presence of a few per cent. of water in the resin facilitates the homogeneity of the material containing this copper coloring agent. Blue aniline dyes are also being experimented with to conceal the yellow, and as this does not appreciably reduce the insulating value of the product it is preferable for electrical work.

For the successful production of organic glass the chief essentials are a good quality urea, and formaldehyde with practically no acidity present. Also the period of reaction between the urea, formaldehyde and lime must not be unduly prolonged otherwise there is a tendency to the formation of sugars (formose) through the polymerization of the formaldehyde by the lime. These sugars, while not greatly affecting the transparency of the finished product, impart brittleness to it. Brittleness also often results from the presence of traces of insoluble

impurities. To obviate this disadvantage the liquor is sometimes filtered after neutralizing, salting out and settling, and before the final concentration in the evaporator.

The manufacture of organic glass is still relatively undeveloped, and at present it is definitely inferior to glass in many respects. At the same time it has many advantages not possessed by glass. Its weight is approximately only half that of glass, this feature alone makes it valuable for use in modern aircraft; in addition, it does not splinter if struck by a bullet or shell fragments. Its hardness is much lower than glass, and it is also more vulnerable to the action of corrosive agents; although weak acids, alkalies or ethyl alcohol do not greatly affect it. Strong mineral acids disintegrate its surface, destroying its transparency and ultimately its structure. The tensile strength of organic glass is about 140 lb. per sq. in., and compression resistance approximately 14 tons per sq. in. Another great advantage is that the material can be easily machined or bored and does not readily chip or fracture in the process.

The fusible variety of urea-formaldehyde resins, *i.e.*, those which have not been hardened by heat, are often marketed as thick viscous aqueous solutions containing a stabilizer, generally an alkaline base. This solution is much used in the decorating and building trades as a priming coat for plaster and wood surfaces; and also in the textile industries for size-making and water-proofing fabrics. Varnishes of value in the electrical industries for the coating of paper and fabric insulation, as well as oil- and spirit-varnishes of the usual type are prepared by evaporating the aqueous viscous solution and finally vacuum-drying the product until the water content is reduced to only a few per cent. The temperature during these concentrating and drying processes should not exceed 70° C., because a higher temperature hardens the product and renders it insoluble in most solvents. The resin thus obtained has a pale brown color and may be dissolved in linseed oil, turpentine oil, or with greater facility in one of the newer solvents, such as hexaline, in admixture with linseed oil. In the presence of hexaline the resin is readily miscible with ethyl alcohol for the making of a spirit varnish, but ethyl alcohol alone does not dissolve the resin to any appreciable extent.

Owing to the high insulating value of the acid-produced resins these are more popular in the electrical trades than the products made with a basic condensing agent. One of the latest uses for the acid-produced resin is in the making of magnet cores, in which the resin is used as a binder for finely divided iron, produced by the thermal decomposition of iron carbonyl. *The Chemical Age*, Oct. 3, '36, p. 295.

Miscellaneous

Victor Chemical Works, Chicago, announce production of technical phosphoric acid in the following forms:

Pyrophosphoric Acid, Technical: A viscous, syrupy liquid tending to solidify on long standing. Sp. gr. 2.04 at 25° C. and 2.015 at 60° C. P_2O_5 content 80%, which is equivalent in strength to 115% orthophosphoric acid. In the presence of water, pyrophosphoric acid hydrates and becomes orthophosphoric acid, the rate of hydration being directly proportional to the temperature. Uses—organic synthesis, as a dehydrating agent, etc. Containers—carboys, casks, metal drums.

100% Phosphoric Acid: Also available commercially. It is in the form of moist crystals with a melting point of 39.5° C. P_2O_5 content is 71%. Shipping containers—steel drums with completely removable heads.

Hemi-Phosphates: Phosphoric acid is also available in the form of very soluble crystalline products, known as "hemiphosphates." These correspond with the formulae $NaH_5(PO_4)2$, $NH_4H_5(PO_4)2$, $Ca(H_5(PO_4)2)2$. The sodium and ammonium salts are stable crystalline compounds. The calcium salt is somewhat hygroscopic. Shipping containers—barrels and kegs.

Fluxes for Soft Solders

Phosphoric acid dissolves many metals, and for many purposes the danger of residues of the acid in soldered articles would be very objectionable. By combining phosphoric acid with a volatile base weaker than ammonia the resulting phosphate was found to be superior to ammonium phosphate. A number of organic nitrogen compounds were selected and their respective phosphates prepared. The most satisfactory results were obtained with the phosphates of aniline and toluidine. From considerations of cost, aniline is to be preferred. *Chemical Trade Journal*, Sept. 18, '36, p231.

Low-Cost Binder

"Raylig," a process for the recovery of natural cement of the tree from the by-products of rayon pulp manufacture, may be used to produce a low-cost binder particularly adapted to treatment of clay-gravel road soils to form smooth-riding, dustless, stabilized roadways. W. G. Drummond, Rainier Pulp & Paper Co., Seattle, states it will materially reduce exorbitant maintenance costs.

Glass Mosaics

Glass mosaics developed by the "Lapis Regis" process are being manufactured by Heaton, Butler & Bayne, London. Small pieces of colored glass, cut to the requisite size for making the picture or design, are placed upon a sheet of plain glass or crystal and the glass is fused into a homogeneous whole by application of heat. Pictures in glass, large or small, may be produced at moderate cost without painting of "leading." Product withstands shock and age very satisfactorily.

Dustless Carbon Black

"Kosmobile 66," new structural type of a semi-fluid reinforcing material has the formation of small cylindrical shaped granules. United Carbon, Charleston, W. Va., producer, claims it is ideal for the rubber industry, having all the requisite physical characteristics.

Plastics from Benzylated Proteins

Useful plastics can be manufactured by the benzylation of casein, animal glue, gelatine and similar products, by treatment with caustic soda and then with benzyl chloride under reflux conditions at 80-110° C. According to process developed by Maksorov and Andrianov (*Rev. Gen. Mat. Plast.*), the reaction product is distilled with steam for removal of volatile materials, washed with warm dilute acetic acid and then with water, and finally dried in vacuum at 80-90° C.

Develops and Fixes in One Bath

A photo-chemical just placed on the market by the Aussiger Verein, Czechoslovakia, develops and fixes a negative in one bath, saving from 13 to 15 minutes in each operation. Company plans a similar developer for positives, according to report received by the Bureau of Foreign and Domestic Commerce.

German Rustproofing Process

A phosphate solution for rustproofing of iron and steel objects has been patented by the German I.G. under the name "Atrament Verfahren". Process, accomplished by means of a spray gun, is particularly adaptable to automobile fenders.

Month's New Dyes

Du Pont Dyestuffs Division offers "Acetamine" Yellow 5G (Patented) which produces bright, greenish shades of yellow on all types of acetate fiber yarns and piece-goods. General Dyestuff releases include Palatine Fast Yellow 6 GEN, a new greenish yellow of the Palatine Fast Series, which because of its very level dyeing properties is of special interest as a shading color for combination shades, and to dyers of knitting and carpet yarns. Hydron Blue GA Paste and Hydron Blue RA Paste are two dyestuffs especially suited for the production of navy blue shades on piece goods. Nerol GGL, a new acid black brought out by I. G. and introduced by General Dyestuff, produces full greenish blacks of interest to the knitting trade.

Rosin Ester

"Harzester AEJ," a new rosin ester on the German market, is distinctive in possessing unusual clearness and light color, which is noticeable even in the finished varnish, according to Department of Commerce reports.

Chemical Frosting of Glass

A rapid dipping process for the chemical frosting of glass is described by E. Arnot (*Sprechsaal*, 69, No. 6, 75—76). The treatment bath is a solution of two parts of hydrofluoric acid, four parts of ammonium fluoride, and one part of soda. The success of the operation depends largely on the correct preparation of the bath.

French Laminated Wood

Isorel, synthetic wood, made by compressing wood fibers with synthetic resins and designed for interior use, is being manufactured in France, according to reports reaching the Commerce Department's Chemical Division. Product is a non-conductor of sound and moisture and has qualities of elasticity and homogeneity.

Filtering Material from Dolomite Rock

"Magnodoppelsatz", filtering material made of dolomite rock quarried in Westphalia, Germany, finds its principal use in deacidifying drinking water by simple filtration, reports Bureau of Foreign and Domestic Commerce.

Chemical Leather Tanning Process

A German chemical process has been reported to the Dept. of Commerce by Sydney B. Redecker, Frankfort-on-Main, for tanning sole leather which promises to reduce Germany's dependence upon foreign tanning sources. Application of the new synthetic tan is said to offer a marked advantage in time saving, costs are said to be no higher than those for the usual bark tanning, and it is claimed that the durability of the sole leather produced exceeds that of bark tan leather.

Rubber Impregnated Thread

Velv-o-Flex, fabric patented by Lawson Knitting Co., Central Falls, R. I., overcomes the difficulty of the use of bare rubber thread in such a manner that the rubber does not show on either side of the fabric. U. S. P. 2,009,361.

Salt Gives Leather Better Backbone

Treatment with common salt is said to greatly extend the life of vegetable tanned leathers according to the Bureau of Chemistry and Soils, U. S. Dept. Agriculture. This is especially helpful in the case of bookbinding leathers.

Improved Zinc Plating Process

A more extensive use of zinc plating for production of attractive and durable rust-resistant surfaces on a wide variety of steel articles has been made possible through development, by R. & H. Chemicals Department, du Pont, of an improved barrel plating process which uses a new brightening agent. New process is particularly adaptable to use in barrel plating of building hardware, radio parts, electrical fixtures and other metal equipment where attractive appearance is important.

New Thermo-Setting Resin

A thermo-setting synthetic resin said to combine astonishing values in short time and low temperature of reaction with other exclusive properties, is announced by I. F. Laucks, Inc., Seattle, Wash. Product, patented under the trade name Lauxite, is derived from a reaction of zinc chloride, urea and formaldehyde.

Ammonia as a Motor Fuel

Ammonia gas as a motor fuel is being experimented with by an Italian company. From a report to the Bureau of Foreign and Domestic Commerce.

Novel Method of Wood Coloring

Novel effects in wood finishes are being created by injecting into living trees pigments which give unusual color combinations to the finished lumber, all of which will require new preservative treatment. *Wall Street Journal*, Sept. 22, '36.

Iron Salts Removal in Rayon Process

Iron salts can be completely removed from copper sulfate solution in cuprammonium rayon manufacture by treating with potassium permanganate in sufficient quantity to oxidize both the iron and any organic substances present. Process, developed in the Bemberg S.A. research laboratories at Gozzano, has been operating successfully for three years, 100 kilos of iron-free copper sulfate being recovered daily on this basis. Only 3 kilos of permanganate are consumed for each 100 kilos of copper and copper loss is less than 1 per cent. Italian Patent 313,822.

Production Plastic Chlorinated Rubber Materials

Plastic chlorinated rubber compositions can be made by chlorinating a mixed solution of rubber and naphthalene or its derivatives, such as hydronaphthalenes or incompletely chlorinated naphthalenes in carbon tetrachloride. The mixture is then precipitated either by treatment with hot water so that the solvent is evaporated, or by addition of non-solvents, *e.g.*, benzine, methyl alcohol, or the solution may be used as a lacquer after aeration and neutralization to remove hydrochloric acid. E. P. 448,093.

New Textile Detergent and Penetrant

"Merpol" B and "Merpol" C (both patented), two new auxiliary products for use in the textile industry are announced by du Pont's Dyestuffs Division. The former is of particular interest as a detergent or cleansing agent with good emulsifying properties, and the latter as an effective penetrant with unusually good solvent properties.

Increasing Zinc Oxide Enamel Gloss

According to German patent No. 625,979 issued to Dr. Hanns Bernard, highly glossy, well leveling zinc oxide enamels can be obtained by the incorporation into the enamel of such wetting or dispersion agents as substituted arylhydroxy fatty acids. Only small amounts are necessary. In most cases a few per cent. will suffice to obtain the desired effect. Fatty acid derivatives which have been found especially effective are phenoxy acetic acid, cresoxy acetic acid, etc.

Beryllium Salts in Lithopone

Use of beryllium salts to increase the light fastness of lithopone pigments is being adopted in the Canadian industry. Advantage of beryllium compounds over cobalt compounds (usually employed for this purpose) lies in the fact that the former do not detract in any way from the whiteness or brilliance of the pigment. *Chemical Trade Journal*, Oct. 2, '36, p286.

Flexible Resins

Extremely flexible phenolic resins, which combine the great bonding strength, water-acid-and-alkali-resistance and friction resistance of a conventional resin with a high degree of flexibility, are announced by General Plastics, North Tonawanda, N. Y. These new Durez resins are widely used for impregnating fabrics, woven belting, brake lining, etc., and are so flexible that a fabric so impregnated can be sharply creased repeatedly with no sign of fracture, nor does aging change this quality.

Fire-Resistant Cotton Duck

Fire-resistant cotton duck which, even when exposed directly to fire, will not ignite, is a product of Wm. E. Hooper & Sons Co., Phila. and Balto. "Fire Chief," as both the treated fabric and the finish itself are known, offers a unique advantage over other methods of "fireproofing" fabric in the fact that its fire-resisting properties are impervious to the action of water or the elements. In addition, the new finish waterproofs the fabric, makes it mildew-resistant and adds materially to its life.

U. S. Chemical Patents

A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Production of urea and an ammonium salt. No. 2,056,283. Charles K. Lawrence, Syracuse, N. Y., and Herman A. Beekhuis, Jr., Petersburg, Va., to Atmospheric Nitrogen Corp., N. Y. City.

Production of fertilizer from ground solid superphosphate, phosphoric acid and liquid anhydrous ammonia. No. 2,057,025. Jacob Frederick Carl Hagens and Ludwig Rosenstein, San Francisco, and Wilhelm Hirschkind, Berkeley, Calif., to The Barrett Co., N. Y. City.

Manufacture of lead arsenates. No. 2,057,985. Alfred M. Thomsen, San Francisco, Calif., to Thomsen Chemical Corp., Calif.

Production of potassium nitrate from potassium chloride and nitrogen dioxide. No. 2,057,957. Oskar Kaselitz, Berlin, Ger.

Production of monocalcium phosphate from raw phosphate and sulfuric acid. No. 2,057,956. Oskar Kaselitz, Berlin, Ger.

Cellulose and Derivatives

Processing system for rayon cakes. No. 2,055,323. Harry C. Uhl, Atlanta, Ga., to G. E., N. Y.

Manufacture of cellulose by the treatment of chemical wood pulp with alkali. No. 2,054,854. Henry Dreyfus, London, England.

Manufacture of derivatives of cellulose and other carbohydrates. Nos. 2,055,892 and 2,055,893. Henry Dreyfus, London, England.

Process for bleaching, refining, and cottonizing raw cellulose. No. 2,055,827. Francesco Carlo Palazzo and Fortunato Palazzo, Florence, Italy.

Composition of a cellulose derivative and a mixed fluorinated halogenated hydrocarbon of the lower aliphatic series. No. 2,056,787. Albert L. Henne, Columbus, Ohio, to General Motors Corp., Del.

Recovery of aralkyl ethers of cellulose. No. 2,056,612. Eugene J. Lorand to Hercules Powder Co., both of Wilmington, Del.

Production of aralkyl ethers of cellulose by reacting alkali cellulose and an aralkyl halide. No. 2,056,324. Eugene J. Lorand to Hercules Powder Co., both of Wilmington, Del.

Process and apparatus for digesting fibrous materials. No. 20,123. Thomas L. Dunbar to Chemipulp Process Inc., both of Watertown, N. Y.

Preparation of hydroxy-cellulose ether solutions. No. 2,057,163. George A. Richter to Brown Co., both of Berlin, N. H.

Process for dissolving cellulose xanthate. No. 2,057,019. Thomas Evans, Scarsdale, N. Y., to Baker Perkins Co., Saginaw, Mich.

Manufacture of cellulosic material from hemp fibers. No. 2,056,995. Edward Chauncey Worden, I, Millburn, N. J., to Hanson & Orth, N. Y. City, a firm comprising Charles D. Orth, Sr., Charles D. Orth, Jr., Michael J. Smith and William Knight, Jr.

Coal Tar Chemicals

Removal of gum forming compounds from fuel gas. No. 2,055,368. Walter L. Shively, East Orange, N. J., to The Koppers Co. of Delaware.

Recovery of organic acids from oxidation products of hydrocarbons. No. 2,055,095. Hans Beller, Ludwigshafen-on-the-Rhine, and Max Schellmann, Mannheim, Germany, to I. G., Frankfort, Germany.

Removal of tar acids from ammonia liquors. No. 2,056,063. Gilbert A. Bragg to The Koppers Co., both of Pittsburgh.

Gas producer. No. 2,056,060. Paul Van Ackeren, Essen, Germany, to The Koppers Co., Pittsburgh.

Manufacture of bases derived from benz-dioxane. No. 2,056,046. Ernest Fourneau to Société des Usines Chimiques Rhone-Poulenc, both of Paris, France.

Preparation of compounds of esters of strong acids with anthrapyrimidines. No. 2,055,933. Karl Koeberle, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Wks., N. Y. City.

Production of diphenyls and chlorinated derivatives thereof from benzene, chlorine and polychlorobenzenes at high temperatures. No. 2,055,-929. Kenneth Shelley Jackson, Runcorn, and George Edwin Wainwright and Herbert Reginald Hailes, Norton-on-Tees, England, to Imperial Chemical Industries, Ltd., Great Britain.

Beta-acetoanthraquinones containing a negative substituent from the halogen or nitro groups. No. 2,055,798. Paul Nawiasky, Ludwigshafen-on-the-Rhine, and Willy Eichholz, Mannheim, Germany, to General Aniline Wks., N. Y. City.

Hydroxyphenylaminoanthracenes. No. 2,055,792. Walter Hagge and Karl Haagen, Dessau in Anhalt, Germany, to General Aniline Wks., N. Y. City.

Preparation of hydrogenated derivatives of naphthalene. No. 2,055,708. Norman D. Scott and Joseph Frederic Walker, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Purification of pyranthrone. No. 2,055,699. James Ogilvie and Maurice H. Fleysher, Buffalo, N. Y., to National Aniline & Chemical Co., N. Y. City.

Cracking liquid carbonaceous materials at high temperature in an apparatus coated with an iron zinc alloy, in the absence of hydrogen. No. 2,055,633. Mathias Pier, Heidelberg, Germany, to I. G., Frankfort, Germany.

Ar-tetrahydro-naphthothiazoles. No. 2,055,609. Herbert A. Lubs and Arthur L. Fox to du Pont, all of Wilmington, Del.

Ar-tetrahydro-naphthyl thioureas. No. 2,055,608. Herbert A. Lubs and Arthur L. Fox to du Pont, all of Wilmington, Del.

Preparation of cyclic 1-2-amino-ketones. No. 2,055,583. Peter Wilhelm Neber, Tubingen, Germany.

Method of scrubbing fuel gas with oil and purifying the spent oil. No. 2,055,496. Dean D. Huffman, Vaughnsville, Ohio, and Walter L. Shively, East Orange, N. J., to The Koppers Co., Delaware.

Production of chrysene from a substance of the indene-hydrindene group in presence of dehydrogenation catalyst No. 2,056,915. Carl Wulff, Ludwigshafen-on-the-Rhine, and Max Treppenhauer, Mannheim, Ger., to I. G., Frankfort, Ger.

Thermal treatment of hydrocarbons in apparatus lined with an element of the 4th group of periodic system. No. 2,056,914. Fritz Winkler and Hans Haeuber, Ludwigshafen-on-the-Rhine, Ger., to I. G., Frankfort, Ger.

Substituted amino-trifluoro-methyl-benzenes No. 2,056,899. Erwin Hoffa and Fritz Müller, Frankfort, Ger., to General Aniline Wks., N. Y. City.

Process for the recovery of phenol from liquors. No. 2,056,748. Alvin Mitton Taylor, Montclair, N. J.

Preparation of anthrapyrimidone sulfonic acids. No. 2,056,548. Klaus Weinand, Leverkusen-I. G. Werk, Germany, to General Aniline Wks., N. Y. City.

Alkylated imidazoles of high molecular weight. No. 2,056,449. Charles Graenacher, Basel, and Franz Ackermann, Binningen, near Basel, Switz., to Society of Chemical Industry in Basle, Basel, Switz.

Derivatives of hydroquinone. No. 2,056,299. Wilfred Archibald Sexton, Blackley, England, to Imperial Chemical Industries Ltd., Great Britain.

Manufacture of para-chloro-ortho-nitro-anisole. Miles Augustinus Dahlen and Elmer Ellsworth Fleck to du Pont, all of Wilmington, Del.

Manufacture of o-nitro-anisole by heating methyl alcohol, o-nitro-chlorbenzene and sodium hydroxide. No. 2,056,260. Miles A. Dahlen and Houghton G. Clapp to du Pont, all of Wilmington, Del.

Para-para-dinitro-diphenylureas. No. 2,056,255. Samuel Coffey and John Edgar Schofield, Huddersfield, England, to Imperial Chemical Industries, Ltd., Great Britain.

Aromatic-hydrocarbon mercury polynuclear-carboxylates. No. 2,056,161. Carl N. Andersen, Watertown, Mass., to Lever Brothers Co., Maine.

Coking process for sulfur containing coal, involving treatment with hydrochloric acid before coking. No. 2,057,486. Ormal A. Higgins to Humphreys Coal & Coke Co., both of Greensburg, Pa.

Preparation of benzyl-benzo-thiazyl sulfide by treating mercaptobenzothiazole with a nitro benzyl halide in presence of organic solvent and alkali. No. 2,057,319. Winfield Scott, Nitro, W. Va., to Monsanto Chemical Co., Wilmington, Del.

Coke oven equipment. No. 2,057,125. Oscar Hilliard Wilson, Fairfield, Ala.

Hydrogenation of phenol and its homologues by subjection to liquid water and a metal capable of liberating hydrogen from the water at high temperatures. No. 2,057,996. Richard Bayer, Bochum-Gerthe, Ger., to Friedrich Uhde, Dortmund, Ger.

Preparation of indole compounds. No. 2,057,948. Ernst Herdieckerhoff, Opladen, and Eduard Tschunker, Cologne-Mulheim, Ger., to General Aniline Wks., N. Y. City.

Polymerization of liquid monomeric polymerizable organic compounds. No. 2,057,674. Charles M. Fields, Arlington, N. J., to du Pont, Wilmington, Del.

Coatings

Manufacture of titanium pigments. No. 2,055,222. Willis F. Washburn, Metuchen Township, Middlesex County, N. J., and Franklin L. Kingsbury, St. Louis, Mo., to Titanium Pigment, N. Y. City.

Producing titanium pigment. No. 2,055,221. Andreas Johan Ravnestad, Frederiksstad, Norway, to Titan Co., Wilmington, Del.

Process of producing foraminous coated material. No. 2,055,002. Frank Jermain Chandler, Toledo.

Enamel coating for cans. No. 2,055,507. Samuel C. Shirley, Oak Park, Ill., to American Can Co., N. Y. City.

Coating for metal hydrogen peroxide containers consisting of a paraffin bitumen mixture. No. 2,056,894. Max E. Bretschger to Buffalo Electro-Chemical Co., both of Buffalo, N. Y.

Rubber like coating for metal and other uses. No. 2,056,836. Werner W. Duecker and Claron R. Payne, Pittsburgh, to Texas Gulf Sulphur Co., Texas.

Nitrocellulose coating composition containing blown China-wood oil and small percentage of sulfur. No. 2,056,832. Elmer A. Daniels, Hinsdale, and Lawrence A. Donovan, Chicago, Ill., to Lawrence A. Donovan and Arthur G. Rubovits, Chicago.

Dielectric material consisting of solid chlorinated diphenyl, mineral oil and soap. No. 2,056,826. Frank M. Clark, Pittsfield, Mass., to G. E. Co., N. Y.

Method of coating by enameling over a previously formed spongy zinc coating. No. 2,056,399. Carroll A. Hochwalt and Herman J. Reboulet to The Mead Research Engineering Co., all of Dayton, Ohio.

Coating composition for fabrics containing nitrocellulose and brominated tricresyl phosphate. No. 2,057,600. Mitchell Graham Thomson, Saltcoats, Scotland, to Imperial Chemical Industries Ltd., Great Britain.

Coating for preservation of living woody plants during transportation. No. 2,057,413. Walter A. Bridgman and J. Allington Bridgman, Owego, N. Y., to Innis, Speiden & Co., Del.

Method of improving leveling quality and flow characteristics of paint by use of less than 0.25% of an organic condensation product of carbon disulfide. No. 2,058,111. George F. A. Stutz and Adolf C. Elm, Palmerton, Pa., to New Jersey Zinc Co., N. Y. City.

Process of coating surfaces with partially polymerized vinyl compounds and aryl phosphate followed by further polymerization. No. 2,057,671. Camille Dreyfus, N. Y. City.

Dyes, Stains, etc.

Preparation of mono-azo dyestuffs. No. 2,055,377. Richard Fleischhauer, Frankfort-on-the-Main-Fechenheim, Germany, to General Aniline Works, Inc., N. Y. City.

Patents digested include issues of the "Patent Gazette," September 22 through October 19 inclusive.

Water insoluble azo dyes. No. 2,055,169. Gérald Bonhôte and Jakob Danuser to Society of Chemical Industry, Basle, both of Basel, Switz.
Production of mono-azo dyestuffs. No. 2,055,074. Richard Fleischhauer, Frankfort-Fechenheim, Germany, to General Aniline Wks., N. Y. City.
Preparation of azo dyes. No. 2,055,050. Hermann Rohrbach, Wolfen, Germany, to General Aniline Wks., N. Y. City.
Water insoluble azo dyestuffs from dihydrobenzocarbazoles. No. 2,054,829. Wilhelm Neelmeier, Leverkusen-Wiesdorf, Heinrich Morschel, Cologne-Deutz, and Otto Goll, Leverkusen-I. G.-Werk, Germany, to General Aniline Wks., N. Y. City.
Manufacture of sulfur dye preparations. No. 2,055,746. Walter Hagge, Dessau in Anhalt, Germany, to General Aniline Wks., N. Y. City.
Azodyestuffs. No. 2,055,741. Fritz Ballauf, Cologne-Mulheim, Germany, to General Aniline Wks., N. Y. City.
Removal from dyestuffs of impurities which stain artificial silk. No. 2,055,686. Karl F. Conrad, Buffalo, N. Y., to National Aniline & Chemical Co., N. Y. City.
Removal of impurities from dyestuffs which interfere with their coloring properties. No. 2,055,685. Lawrence H. Flett, Hamburg, N. Y., to National Aniline & Chemical Co., N. Y. City.
Process for preparation of synthetic coloring matter. No. 2,055,634. Marvin M. Rosson, Los Angeles, to Stand. Oil Development Co., Delaware.
Water soluble tri-arylmethane dyes, dyeing wool blue tints of good light fastness. No. 2,055,607. Frank William Linch and Herbert Holroyd Stocks, Blackley, Manchester, England, to Imperial Chemical Industries Limited, Great Britain.
Tetrazoimino compounds. No. 2,055,547. Eugene A. Markush, Jersey City, N. J., to Pharma Chemical Corp., N. Y. City.
Production of 3.3'-dichlorindanthrone. No. 2,056,593. William Smith and John Thomas to Scottish Dyes, Ltd., Grangemouth, Scotland.
Preparation of azo-dyestuffs. No. 2,056,539. Hans Schindhelm, Richard Gast, and Richard Fleischhauer, Frankfort, Germany, to General Aniline Wks., N. Y. City.
Preparation of anthraquinone derivatives. Frank Lodge and Colin Henry Lumsden, Blackley, Manchester, England, to Imperial Chemical Industries Ltd., Great Britain.
Method of dyeing sponges. No. 2,050,166. Milton Cohn, N. Y. City.
Green azodyestuffs. No. 2,057,455. Konrad Stenger and Carl Erich Müller, Frankfort, Ger., to General Aniline Wks., N. Y. City.
Azo dyes and their production. No. 2,057,063. Wilfred Archibald Sexton, Blackley, Manchester, England, to Imperial Chemical Industries Ltd., Great Britain.
Manufacture of green dyes of the lead phthalocyanine series. No. 2,056,944. Reginald Patrick Linstead and Charles Enrique Dent, South Kensington, London, England, to Imperial Chemical Industries Ltd., Great Britain.
Water-insoluble azo dyestuffs. No. 2,058,222. Ernst Fischer, Offenbach-on-the-Main, Ger., to General Aniline Wks., N. Y. City.
Azo dyestuffs. No. 2,057,685. Arthur Howard Knight, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., Great Britain.
Dye mixture composed of an unreduced dye in an insoluble state, invert sugar and alkali. No. 2,057,668. Wiley Paul Bolen to Dusseldorf Chemical Co., both of Savannah, Ga.

Explosives

Production of granular free-flowing detonating explosive. No. 2,055,403. Willard de C. Crater, Newark, Del., to Hercules Powder Co., Wilmington, Del.
Method of making explosive devices. No. 2,056,509. Achillo Fabrizio, Havre de Grace, Md.
Preparation of tetranitromethane. No. 2,057,076. Joseph A. Wyler, Allentown, Pa., to Trojan Powder Co., N. Y.

Fine Chemicals

Producing colored photographic materials. No. 2,055,407. Bela Gáspár, Brussels, Belgium.
Preparation of acetals. No. 2,055,391. Werner Starck, Hofheim, Germany, to I. G., Frankfort, Germany.
Process for manufacture of 3-keto acids of the sugar series and their anhydrides. No. 2,056,126. Tadeus Reichstein, Zurich, Switz., to Hoffmann-La Roche, Inc., Nutley, N. J.
Production of oxalyl chloride. No. 2,055,617. Peter J. Wiezevich, Elizabeth, N. J., to Stand. Oil Development Co., Del.
Formation of insoluble polymers by polymerization of divinylacetylene in the presence of iodine. No. 2,055,597. James H. Werntz, Marshallton, Del., to du Pont, Wilmington, Del.
Manufacture of sodium n-methyl-c, c-allyl-isopropyl barbiturate in a stable, dry state readily soluble in water. No. 2,056,892. Otto Schnider, Basel, Switz., to Hoffmann-La Roche Inc., Nutley, N. J.
Production of metacrylic acid and its esters. No. 2,056,771. John William Croom Crawford, Norton-on Tees, England, to Imperial Chemical Industries, Great Britain.
Method of preparing optically active trans-pi-hydroxycamphor from optically active alpha-pi-(trans)-dihalogen-camphor. No. 2,056,441. Yasuhiko Asahina and Morizo Ishidate, Tokyo, Japan.
Apparatus for impregnation of materials with radium emanation. No. 2,056,370. Egon Rosenberg, Berlin, and Paul Happel, Hamburg, Ger.
Alkali-earth metal salts of aralkyl esters of para-hydroxybenzoic acid. No. 2,056,176. William H. Engels and John Weijiard to Merck & Co., all of Rahway, N. J.
Photographic developer containing pyrogallol monoalkyl ether together with hydroquinone. No. 2,057,451. Hermann Schultes, Mainz-Mombach, Ger., to Deutsche Gold-und Silber-Scheideanstalt, vormals Roessler, Frankfort, Ger.
Production of vanillin from a material of the group ligno-cellulose, crude lignin extract or lignin-sulfonic acid compound. No. 2,057,117. Lloyd T. Sandborn, Jörgen Richter Salvesen, and Guy Clemens Howard, Wausau, Wis., to Marathon Paper Mills Co. and Guy C. Howard Co both of Rothschild, Wis.
Light-sensitive material insensitive to visible rays and process. No. 2,056,016. Jan Hendrik de Boer and Cornelis Johannes Dippel to N. V. Philips' Gloeilampenfabrieken, all of Eindhoven, Netherlands.
Purification of ether by dephlegmating the ether to remove alcohol followed by contact with mercuric oxide. No. 2,056,972. William A. Lott, Newark, N. J., to E. R. Squibb & Sons, N. Y. City.
Aromatic mercury alcoholates of hydroxy fatty compounds. No. 2,056,945. Carl N. Andersen, Watertown, Mass., to Lever Bros. Co., Maine.
Manufacture of phenylethyl alcohol or its homologous compounds. No. 2,058,373. Albert Weissenborn, Dessau in Anhalt, Ger., to Winthrop Chemical Co., N. Y. City.
Treatment and packaging of ether. No. 2,058,250. Ferdinand W. Nitardy, Brooklyn, N. Y., to E. R. Squibb & Sons, N. Y. City.
Camphoric salt of alpha-methyl-heptyl-hydro-cupreicine and method of making same. Fritz Johannessohn, Mannheim-Feudenheim, and Heinrich Thron, Mannheim-Waldhof, Ger., to Rare Chemicals, Inc., Nepara Park, N. Y.
Method of extracting a sweet ingredient from Glycyrrihiza Glabra (Linn). No. 2,058,019. Yutaka Ito, Misaki-Cho, Hayashida-Ku, Kobe, Japan, to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan.
Heterocyclic compounds. No. 2,057,978. Joachim Reitmann, Wuppertal/Elberfeld, Ger., to Winthrop Chemical Co., N. Y. City.
Process for the manufacture of derivatives of α, α, α-tribromoethane. No. 2,057,964. Hans-Paul Müller, Wuppertal-Elberfeld, Ger., to Winthrop Chemical Co., N. Y. City.
Stabilizing silver halide emulsions with compounds from the group sulfonic acid, seleninic acid and their salts. No. 2,057,764. Johannes Brunken, Dessau in Anhalt, Ger., to Agfa Ansco Corp., Binghamton, N. Y.

Glass and Ceramics

Glass resistant to hot alkali metal vapor. No. 2,056,930. Louis Navius, Schenectady, N. Y., to G. E. Co., N. Y.
Glass transparent to ultraviolet light. No. 2,056,627. Josephus Antonius Maria Smelt, Eindhoven, Netherlands, to G. E., N. Y.
Vitreous enamel dispersion composed of vitreous enamel frit and a liquid cobalt compound. No. 2,058,209. Rudolph S. Bley, Elizabethton, Tenn., to The Porcelain Enamel and Mfg. Co., Baltimore.
Composition and method of setting up of vitreous enamel slips. No. 2,057,958. Charles J. Kinzie, Niagara Falls, N. Y., to The Titanium Alloy Mfg. Co., N. Y. City.

Industrial Chemicals, Apparatus, etc.

Recovery of sulfuric acid from aqueous acid liquors. No. 2,055,419. Ludwig Rosenstein to Shell Development Co., both of San Francisco, Calif.
Freeing sodium meta phosphate from iron meta phosphate. No. 2,055,-332. Charles S. Bryan, Providence, R. I., to Rumford Chemical Wks., Rumford, R. I.
Manufacture of sodium aluminum sulfate. Nos. 2,055,283 and 2,055,-284. Augustus H. Fiske, Warren, and Charles S. Bryan, Providence, R. I., to Rumford Chemical Wks., Rumford, R. I.
Apparatus for making combustible gas. No. 2,055,190. Daniel J. Young to Young-Whitwell Gas Process Co., both of Tacoma, Wash.
Producing white cyanide by fusion. No. 2,055,136. Edward J. Pranke, Great Barrington, Mass., to du Pont, Wilmington, Del.
Manufacture of carbonates by heating bicarbonates suspended in an inert gas. No. 2,055,084. Robert B. MacMullin, Niagara Falls, N. Y., to Mathieson Alkali Wks., N. Y. City.
Method of fixing sulfur dioxide as sulfuric acid and ferric sulfate. No. 2,055,082. Harmon E. Keyes, Miami, Ariz.
Process of recovering sulfur in conjunction with melting pyrites and pyritic material. No. 2,054,941. Axel Rudolf Lindblad, Djursholm, Sweden.
Fabricating alloy lined pressure vessels. No. 2,054,939. Louis J. Larson to A. O. Smith Corp., both of Milwaukee, Wis.
Purifying device for gas masks. No. 2,054,890. Gerhard Karl Emil Heinrich Stampe, Lubeck, Germany, to Bernhard Drager, Brasov, Rumania.
Producing metal catalyst base. No. 2,054,889. William Sieck, Jr., Hubbard Woods, Ill.
Detection of mustard gas by the color change of the salt of gold, platinum, palladium or univalent copper. No. 2,054,885. Gustav-Adolf Schröter, Dessau, Germany, to Otto Heinrich Drager, Lubeck, Germany.
Manufacture of lower fatty acid anhydrides by thermal decomposition of the acid vapor in presence of silica gel and a compound having an inorganic acid radical. No. 2,054,865. Horace Finningley Oxley and Leonard Fallows, Spondon, near Derby, England, to Celanese Corp. of America, of Delaware.
Manufacture of aliphatic anhydrides by thermal decomposition of an aliphatic acid in presence of a catalyst. No. 2,054,853. Henry Dreyfus, London, and Horace Finningley Oxley and Leonard Fallows, Spondon, near Derby, England, to Celanese Corp. of America.
Method of making chlorhydrin esters. No. 2,054,814. Charles G Harford, Wollaston, Mass., to Arthur D. Little, Inc., Cambridge, Mass.
Preparation of carboxylic acids. No. 2,054,807. Gilbert B. Carpenter, Framingham, Mass., to du Pont, Wilmington, Del.
Production of soluble starch by treatment with an alkali in the presence of an alkali salt of a reaction product of sulfuric acid and a fatty alcohol. No. 2,056,104. Richard Hueter, Haus Waldfrieden, Rosslau-in-Anhalt, Germany, to "Unichem" Chemikalien Handels A.-G., Zurich, Switz.
Production of albumen from egg whites. No. 2,056,082. Samuel Tranin, Kansas City, Mo.
Apparatus and method of producing chromic acid from a soluble chromium salt. Nos. 2,055,961 and 2,055,962. John Wesley Boss, Livingston, Mont.
Production of calcium aluminate and alumina from crude calcium aluminate. No. 2,055,947. Jean Charles Séailles, Paris, France.
Oil waste reclamation process. No. 2,055,943. Edwin S. Pearce, to Railway Service & Supply Corp., both of Indianapolis.
Filtration process No. 2,055,869. Fred W. Manning, Altadena, Calif., to F. W. Manning Co., Los Angeles.
Ozone generator. No. 2,055,809. Justin F. Wait, N. Y. City.
Treatment of massecuite. No. 2,055,778. George E. Stevens, Scottsbluff, Nebr., to Western States Machine Co., Salt Lake City.
Apparatus for removal of objectionable odors from air using activated carbon as the absorbent. No. 2,055,774. Arthur B. Ray, Bayside, N. Y., to Union Carbide and Carbon Corp., N. Y.
Method of rendering the residue of a calcium carbide-water acetylene generator suitable for use in the chemical industry. No. 2,055,773. Everett E. Radcliffe, Scarsdale, N. Y., to Union Carbide and Carbon Corp., N. Y.
Process for sulfation of olefines. No. 2,055,763. Paul S. Greer and Richard Gorman, Jr., Charleston, W. Va., to Union Carbide and Carbon Corp., N. Y.
Production of active carbon. No. 2,055,755. Kenneth Barton Stuart, Pueblo, Colo., to The Colorado Fuel and Iron Corp., Denver.
Chloridizing roasted sulfide ores containing zinc. No. 2,055,613. Royal L. Sessions to Hughes-Mitchell Processes, all of Denver.
Treatment of a sulfurous reducing agent with carbon bearing an adsorbed non-gaseous oxidizing agent. No. 2,055,475. Abraham Sidney Behrman, Chicago.
Production of alkaline compounds, sulfuric acid and other valuable

chemicals. No. 2,056,929. Hugh K. Moore to Brown Co., both of Berlin, N. H.

Dispersion of zinc oxide in water solution. No. 2,056,924. Wilfrid A. Kalber, Somerville, Mass., to Dewey and Almy Chemical Co., North Cambridge, Mass.

Production of hydrogen from a hydrocarbon in presence of steam with aid of a catalyst. No. 2,056,911. Georg Schiller and Gustav Wietzel, Mannheim, Ger., to I. G., Frankfort, Ger.

Production of activated carbon by the impregnation of cocoa bean shells with an alkali-sulfide and subsequent heating to 500° C. No. 2,056,854. Emil Hene, London, England.

Refining of olefine sulfide. No. 2,056,837. Werner W. Duecker and Claron R. Payne, Pittsburgh, to Texas Gulf Sulphur Co., Texas.

Preparation of polyglycols. No. 2,056,830. Gerald H. Coleman and Garnett V. Moore to The Dow Chemical Co., all of Midland, Mich.

Preparation of phenyl-magnesium chloride from magnesium and chlorobenzene. No. 2,056,822. Edgar C. Britton and Harold R. Slagh to The Dow Chemical Co., all of Midland, Mich.

Manufacture of bleached dry dextrine composition. No. 2,056,575 Alfred A. Haldenstein, North Plainfield, N. J., to National Adhesives Corp., N. Y. City.

Prevention of hardening of salt by the addition of 0.05% to 3% glycerine. No. 2,056,540. Marnell Segura, Jefferson Island, La., to Jefferson Island Salt Mining Co., Louisville, Ky.

Separation of chlorhydrins from hydrochloric acid solution. No. 2,056,-448. Paul Ferrero, Tertre, and Corneille Vandendries, Baudour, Belgium, to Societe Carbochimique, Société Anonyme, Brussels, Belgium.

Cell for electrolysis of fused salts. No. 2,056,184. Harvey N. Gilbert, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Method of removing bismuth and alkaline earth metals from lead. No. 2,056,164. Jesse O. Betterton and Yurii E. Lebedeff, Metuchen, N. J., to American Smelt. & Ref. Co., N. Y. City.

Denaturing alcohol by the addition of a mixture of higher monohydroxy aliphatic alcohols. No. 2,056,163. Julius F. T. Berliner to du Pont, both of Wilmington, Del.

Separation and recovery of krypton and xenon from air. No. 2,057,459. Claude C. Van Nuys, Cranford, N. J., to Air Reduction Co., N. Y. City.

Oil filtering element made by mixing activated adsorbent particles with water glass, baking and reactivating. No. 2,057,414. Southwick W. Briggs and Chester G. Gilbert, both of Washington, D. C.

Refractory composed of finely divided carbon, granular coke, and finely divided clay. Nos. 2,057,348 and 2,057,349. Mahlon J. Rentschler, Willoughby, Ohio.

Producing a catalyst of aluminum. No. 2,057,306. Friedrich Martin, Oberhausen, Walter Grimme, Oberhausen-Sterkrade, and Alfred Koppelmann, Oberhausen-Holten, Ger.

Production of hydrocyanic acid from the reaction of a hydrocarbon and ammonia. No. 2,057,282. Heinrich Tramm, Oberhausen-Holten, and Walter Grimme, Oberhausen-Sterkrade, Ger., to Ruhrchemie Akt., Oberhausen-Holten, Ger.

Activation of bleaching clays by treatment with carbon dioxide and subsequent electrodialysis. No. 2,057,232. Kurt Endell, Berlin-Steglitz, Ger., to Possehl's Apparatebau-und Export-Gesellschaft m.b.H., Lubeck, Ger.

Apparatus for salting water. No. 2,057,208. William T. Runcie, Maplewood, N. J.

Production of oxalic acid by treatment of a carbohydrate with nitric acid in presence of sulfuric acid. No. 2,057,119. George Stevens Simpson, Plainfield, N. J., to General Chemical Co., N. Y. City.

Production of sulfur dioxide. No. 2,057,099. Harold O. C. Ingraham, Greenwich, Conn., to General Chemical Co., N. Y. City.

Method and apparatus for continuous extraction of solids by solvents which may be used in producing alumina. No. 2,056,993. Melvin Powell Weigel, East St. Louis, Ill., to Aluminum Corp. of America, Pittsburgh.

Separation of volatile high molecular weight unsaponifiable material from saponifiable material by saponification followed by distillation. No. 2,056,984. Max Schellmann, Oppau, and Hans Franzen, Mannheim, Ger., to I. G., Frankfort, Ger.

Production of glycols from olefin halide and water in presence of a catalyst. No. 2,056,976. Nathan M. Mnookin to Synthetic Products, Inc., both of Kansas City, Mo.

Production of cyclic ethers by treatment of halogen substituted dialkyl ethers with oxides of metals at least as low as lead in electro-potential series. No. 2,056,960. Henry Dreyfus, London, England.

Process and apparatus for making corrugated vegetable-fiber board. Nos. 2,058,333 and 2,058,334. William H. Mason to Masonite Corp., both of Laurel, Miss.

Process of preparing persulfonic acid compounds by the reaction of an aryl sulfonic acid metal salt with a peroxide from the group consisting of hydrogen peroxide and the alkali metal peroxides. No. 2,058,315. Richard Huttonlocher and Wilhelm Lamatsch, Oberlahnstein-on-the-Rhine, Ger., to Buffalo Electro Chemical Co., Buffalo, N. Y.

Process for clarifying tanning extracts. No. 2,058,303. Fernando Fontana to La Forestal Argentina, S. A. de Tieras, Maderas y Explotaciones Comerciales e Industriales, both of Buenos Aires, Argentina.

Process for extracting potash salts from crude salts. No. 2,058,300. Thomas M. Cramer, Carlsbad, N. Mex., and George A. Connell, San Pedro, Calif., to Pacific Coast Borax Co., Nev.

Method of examining state of crystallization of calcined alumina by dyeing with alizarin red and testing microscopically the color intensity. No. 2,058,178. Reinhold Reichmann, Berlin, Ger., to Siemens & Halske, Akt., Siemensstadt, Ger.

Recovery of alumina from aluminous silicious material. No. 2,058,145. Roy C. Folger, Dearborn, Mich., to The Electric Smelting and Aluminum Co., Cleveland.

The separation and recovery of the magnesium and the calcium content of dolomite. No. 2,058,141. Elmer E. Dougherty, Glen Ridge, N. J., to Polytechnic Development Corp., N. Y.

Process for making artificial cryolite and sodium fluoride from sodium aluminate, sodium hydroxide and hydrofluoric acid. No. 2,058,075. Gant Gaither, Hopkinsville, Ky.

Manufacture of amides of higher fatty acids. No. 2,058,013. Clyde O. Henke and Walter H. Zartman to du Pont, all of Wilmington, Del.

Hydrogenation of carbonaceous materials by heating in a closed reaction zone in presence of water and a catalyst capable of producing nascent hydrogen. No. 2,057,971. Theodor Wilhelm Pfirrmann, Castrop-Rauxel, Ger., to Friedrich Uhde Ingenieur-Buro, Dortmund, Ger.

Method of influencing the chemical and physical properties of blast furnace slags by blowing silica into the furnace below the plane of the tuyers. No. 2,057,919. Josef Roll, Hamborn-Bruckhausen, Ger.

Method of separating the constituents of air. No. 2,057,804. Lee S. Twomey, Vista, Calif.

Production of vegetable phosphatide preparations. No. 2,057,695. Albert Schwieger, Hamburg, Ger., to American Lecithin Co., Cleveland, Ohio.

Preparation of elongated shapes of indefinite length composed of polymerized organic compounds. No. 2,057,673. Reuben T. Fields, Arlington, N. J., to du Pont, Wilmington, Del.

Leather and Tanning

Process for dyeing leather with a mono-azo dyestuff. No. 2,058,183. Emil Senn, Riehen, near Basel, Switz., to J. R. Geigy A. G., Basel, Switz.

Metals, Alloys, Ores

Electrolytic process for producing magnesium. No. 2,055,359. Wilhelm Moschel, Bitterfeld, Germany to Magnesium Development Corp., of Delaware.

Purification of zinc by distillation of lead contaminated zinc containing sufficient iron to inhibit distillation of lead. No. 2,055,195. Louis Scott Deitz, Jr., Metuchen, N. J., and Bernard Mansfield, Tottenville, N. Y., to Nassau Smelt. & Ref. Co., N. Y. City.

Electroplating apparatus. No. 2,055,070. Emil Ericksson to Standard Process Corp., both of Chicago.

Corrosion resistant alloy containing carbon, chromium, nickel, molybdenum, antimony, copper and iron. No. 2,054,927. Carl Carius, Essen, Germany, to Freid. Kruff Aktiengesellschaft, Essen-on-the-Ruhr, Germany.

Vacuum treatment of metals. Nos. 2,054,922 and 2,054,923. Jesse O. Betterton and Albert J. Phillips, Metuchen, N. J., to American Smelt. & Ref. Co., N. Y. City.

Vacuum apparatus for producing oxygen-free, gas-free metals. No. 2,054,921. Jesse O. Betterton, Metuchen, N. J., to American Smelt. & Ref. Co., N. Y. City.

Removal of thick deposits of electrolytic chromium from the cathode. No. 2,055,963. John Wesley Boss, Livingston, Mont.

Bearing metal alloy comprising 1% to 2% copper, 0.01% to 0.15% magnesium, 0.05% to 0.5% silver, and the balance cadmium. No. 2,055,-740. Rowland Thomas Dryll Williams, New Town, Hobart, Tasmania, Australia.

Recovery of tin from tin containing metal. No. 2,055,732. Ludwig Schertel, Essen, Germany.

Seam for copper roofs consisting of lead alloyed with cadmium in proportion between 11% and 20%. No. 2,055,614. Edmund H. Sheaff, Merrick, N. Y., to National Lead Co., Jersey City, N. J.

Process of making nickel alloys containing more than about 1% of alkaline earths. No. 2,055,467. Hugh S. Cooper, Cleveland, Ohio, to Union Carbide and Carbon Corp., N. Y.

Production of iron-chromium castings containing nitrogen. No. 2,056,-766. Frederick M. Becket to Union Carbide and Carbon Corp., both of N. Y. City.

Chromium alloy steel and welding rod. No. 2,056,765. Frederick M. Becket, N. Y. City, and Russell Franks, Jackson Heights, N. Y., to Union Carbide and Carbon Corp., N. Y. City.

Method of mineral separation. No. 2,056,764. William E. Beatty, Hollywood, Calif.

Production of hard metal alloys. No. 2,056,708. Gustav Boecker, Essen, Germany.

Corrosion resistant aluminum alloy containing .1% to 6% thorium. No. 2,056,604. William Guertler, Berlin, Germany, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfort, Germany.

Ferrometal alloys with a reduced tendency to corrode. Nos. 2,056,588, 2,056,589, 2,056,590 and 2,056,591. Hermann Schulz and Carl Carius, Dortmund, Germany, to Vereinigte Stahlwerke Akt., Dusseldorf, Germany.

Apparatus for roasting ores. No. 2,056,564. Bernard M. Carter, Montclair, N. J., to General Chemical Co., N. Y. City.

Oil burning ore smelting and converting furnace. No. 2,056,499. John Anson, San Pedro, Calif.

Protection of heat resistant alloys against carburization by fusing on a coating of B_2O_3 and V_2O_5. No. 2,056,386. Adrien Cambron, Ottawa, Ontario, Canada.

Degassing molten aluminum and its alloys. Nos. 2,056,233 and 2,056,-234. Philip T. Stroup, New Kensington, Pa., to Aluminum Corp. of America, Pittsburgh.

Ore concentrator. No. 2,056,190. Enos R. Horton, Denver, Colo.

Method of heat treating a metal in an atmosphere of carbon dioxide, methane and hydrogen. No. 2,056,175. Fritz Eberle and Crandall Z. Rosecrans to Leeds & Northrup Co., all of Philadelphia.

Production of rustless iron. No. 2,056,162. William B. Arness to Rustless Iron and Steel Corp., both of Baltimore.

Electrothermic reduction of iron ores. No. 20,128. Sydney T. Wiles to Buffalo Electric Furnace Corp., both of Buffalo, N. Y.

Electrodeposition of ruthenium from a bath containing 4 gm. of ruthenium per liter as a ruthenium nitroso compound. No. 2,057,638. Fritz Zimmermann, Newark, and Herbert Emil Zschiegner, Ocean Grove, N. J., to Baker & Co., Newark, N. J.

Method and apparatus for the reduction of oxide ores. No. 2,057,554. James D. Bradley, Pittsburgh, Pa.

Electrodeposition of rhodium from an aqueous rhodium lactate solution. No. 2,057,476. Sigmund Cohn, N. Y. City, to Baker & Co., Newark, N. J.

Electrodeposition of rhodium from an aqueous alkaline bath of rhodium containing phosphoric acid. No. 2,057,475. Sigmund Cohn, N. Y. City, to Baker & Co., Newark, N. J.

Process and furnace for making mineral wool. No. 2,057,393. Edward R. Powell, Alexandria, Ind., to Johns-Manville Corp., N. Y. City.

Copper alloy containing 0.2 to 1.0% chromium and 0.35 to 1.0% aluminum. No. 2,057,368. Michael George Corson to Union Carbide and Carbon Research Lab., both of N. Y. City.

Method of introducing nitrogen into ferrous metals. No. 2,057,274. Wallace Nelson Mayhew, Philadelphia.

Method of stripping rhodium plating. No. 2,057,272. Karl Schumpelt, Union, N. J., to Baker & Co., N. J.

Method of stripping composite coat of nickel and rhodium from silver or silver plated article by immersion in phosphoric acid and water. No. 2,057,271. Karl Schumpelt, Union, N. J., to Baker & Co., N. J.

Apparatus for coating and treating continuous sheet material. No. 2,056,939. George C. Borden, Jr., Riegelsville, Pa., to Riegel Paper Corp., Riegelsville, N. J.

Alloys whose principal constituents are copper, chromium, silicon and iron. Nos. 2,058,375 and 2,058,376. James H. Critchett, Douglaston, N. Y., to Union Carbide and Carbon Corp., N. Y.

Method for the electrolytic deposition of zinc upon an electrolytically deposited zinc starting sheet. No. 2,058,259. Oliver C. Ralston and William John Uren, Clarkdale, Ariz., to Phelps Dodge Corp., N. Y. City.

Method of making lead-alkaline earth alloys by melting together lead, an alkaline earth metal carbide, and aluminum, the aluminum combining with the carbide. No. 2,058,231. Sidney M. Hull, Western Springs, Ill., to Western Electric Co., N. Y. City.

Manufacture of ferrocobalt electrolytically from a cobalt, copper and iron alloy. No. 2,058,126. Francis Lawrence Bosqui to Rhokana Corp., Ltd., both of N'Kana, Northern Rhodesia.
Brake drum of malleable cast iron containing 0.5% to 2.0% copper. No. 2,058,039. Harry A. Schwartz, Cleveland Heights, Ohio, to National Malleable and Steel Castings Co., Cleveland.
Method of hardening alloy glass machine castings by heat treatment. No. 2,057,892. Alfred W. Gregg and Raymond H. Frank to The Bonney-Floyd Co., all of Columbus, Ohio.
Hardening iron and steel alloys by treatment with a compound containing PO_4 radical and then nitriding the alloy. No. 2,057,813. Marie Louis André Babinet, Boulogne-sur-Seine, France, to The Nitralloy Corp., Del.
Process of making tungsten carbide castings. No. 2,057,786. Oscar L. Mills to Mills Alloys, Inc., both of Los Angeles.
Coating metallic refrigerator parts with hot zinc followed by electroplating with tin. No. 2,057,762. Wallace Boone and Lewis M. Crosley to The Crosley Radio Corp., all of Cincinnati.

Naval Stores

Method of production of hydrogenated rosin, abietic acid and hydrogenated metal salts of rosin and abietic acid. No. 2,054,834. Ebenezer Emmet Reid, Baltimore, Md., to Hercules Powder Co., Wilmington, Del.
Production of sulfur containing abietyl compounds. No. 2,055,727. Emil Ott, Elsmere, Del., to Hercules Powder Co., Wilmington, Del.
Sulfonated terpene product and method of producing. No. 2,058,389. Alfred L. Rummelsburg to Hercules Powder Co., both of Wilmington, Del.

Paper and Pulp

Manufacture of sized papers. No. 2,055,799. Charles R. Outterson, Watertown, N. Y., to Bennett, Inc., East Cambridge, Mass.
Method for carbonization of pulp waste lyes. No. 2,056,746. Ernst Strupp, Munich, Germany.
Manufacture of chemically modified papers. No. 2,056,294. George A. Richter to Brown Co., both of Berlin, N. H.
Apparatus and process for black liquor recovery system. No. 2,056,266. Edward G. Goodell, Stevens Point, Wis.
Production of unsized paper. No. 2,056,209. Harold Robert Rafton, Andover, Mass., to Raffold Process Corp., Mass.
Treatment of sulfite process paper machine effluent. No. 2,057,059. John D. Rue, Niagara Falls, N. Y., to Hooker Electrochemical Co., N. Y. City.
Method of sizing paper. No. 2,058,085. Otto Kress and Charles E. Johnson to The Institute of Paper Chemistry, all of Appleton, Wis.

Petroleum and Petroleum Chemicals

Treating asphaltic oil to produce oxidized asphalt. No. 2,055,459. Adolf Gutzwiller, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.
Production of olefin derivatives. No. 2,055,456. Egon Eichwald, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.
Hydrogenation of unsaturated alcohols. No. 2,055,437. Herbert P. A. Groll and James Burgin, Oakland, Calif., to Shell Development Co., San Francisco, Calif.
Removal of wax and asphaltic bodies from mineral oil by treatment at 0° F. with light hydrocarbons and liquid sulfur dioxide. No. 2,055,428. Richard Jewell Dearborn, Summit, N. J., to The Texas Co., N. Y. City.
Manufacture of stable synthetic oil from mineral oil distillate boiling within gasoline range and containing substantial portion of unsaturates. No. 2,055,425. Johan Ferdinand Maurits Caudri, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.
Sweetening process for the conversion of mercaptans to disulfides. No. 2,055,423. Arnold Belchetz, Houston, Tex., to Shell Development Co., San Francisco, Calif.
Process for lowering the pour point of mineral oils. No. 2,055,417. Franz Rudolf Moser, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.
Refining mineral oils with hot liquid sulfonic acid. No. 2,055,416. Franz Rudolf Moser, Amsterdam, Netherlands, to Shell Development Co. San Francisco, Calif.
Polymerization and condensation of low boiling hydrocarbons with anhydrous P_2O_5 in presence of an oxy-organic compound. No. 2,055,415. Boris Malishev, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.
Thermal conversion of hydrocarbons by contact with molten material. No. 2,055,313. Robert Freeborn Ruthruff, Whiting, Ind., to Stand. Oil (Ind.), Chicago.
Manufacture of alcohol by hydrating in presence of catalyst the corresponding olefine having at least one double bond. No. 2,055,269. Adrianus Johannes Van Peski and Siegfried Leonard Langedijk, Amsterdam, Netherlands, to Shell Development, San Francisco.
Expander for cracking hydrocarbon oils. No. 2,055,212. Ernest W. Zublin to Texas Pacific Coal & Oil Co., both of Fort Worth, Tex.
Production of mineral lubricating oil by dehydrogenating unsaturated constituents with colloidally dispersed sodium. No. 2,055,210. Richard S. Vose, Ridley Park, Pa., to Sun Oil, Philadelphia.
Production of valuable oils from asphalts and resinous hydrocarbon mixtures. No. 2,055,135. Mathias Pier and August Eisenhut, Heidelberg, Germany, to I. G., Frankfort, Germany.
Entrainment separator for fractionating towers. No. 2,055,048. John Harold Puls, Los Angeles, to The Texas Co., N. Y. City.
Producing anti-knock motor fuel from destructive distillation products of solid carbonaceous material. No. 2,055,029. Victor Henny, London, England, to Universal Oil Products, Chicago.
Production of low boiling point oils from heavy petroleum hydrocarbons or carbonization products of pyrobituminous materials. No. 2,055,028. Victor Henny, London, England, to Universal Oil Products, Chicago.
Refining hydrocarbon oils by treatment under pressure at temperatures above the normal boiling point with aqueous hydrogen chloride and zinc chloride. No. 2,055,027. Roland B. Day, to Universal Oil Products, both of Chicago.
Process for conversion of a hydrocarbon oil. No. 2,955,015. Jacque C. Morrell, to Universal Oil Products, both of Chicago.
Reclamation of oil waste. No. 2,055,938. John J. McKeon, Troy, N. Y., to Railway Service & Supply Corp., Indianapolis.
Conversion of hydrocarbon oils. No. 2,055,896. Jacob Benjamin Heid to Universal Oil Products Co., both of Chicago.
Treatment of gaseous olefinic hydrocarbons at high temperatures with aqueous hydrogen chloride and a metal capable of liberating hydrogen therefrom so as to produce an anti-knock motor fuel blending agent. No. 2,055,875. Jacque C. Morrell, to Universal Oil Products Co., both of Chicago.
Stabilizer for cracked hydrocarbon motor fuels. No. 2,055,810. Thomas W. Bartram, Nitro, W. Va., to Monsanto Chem. Co., Wilmington, Del.
Hydration of olefines. No. 2,055,720. Alfred W. Francis, Woodbury, N. J., to Socony-Vacuum Oil Co., N. Y. City.
Portable foam column. No. 2,055,640. Jules Verner, Linden, N. J., to Stand. Oil Development Co., Delaware.
Method of determining pentanes plus in a gaseous mixture. No. 2,055,628. Alois Kremser, Berkeley, Calif., to Stand. Oil Co. of Calif., San Francisco.
Method of dewaxing oil. No. 2,055,627. Leon C. Kettenring, Plainfield, and Louie H. Robertson, Elizabeth, N. J., to Stand. Oil Development Co., Delaware.
Revivifying spent adsorbent clays with a hydrocarbon mixture prepared by the vapor phase destructive hydrogenation of petroleum distillates. No. 2,055,616. John V. Starr, Cranford, N. J., to Standard-I. G. Co.
Preparation of a liquid motor fuel containing nitrates. No. 2,055,503. Ira C. Nourse, Tulsa, Okla.
Removal and purification of soaps from asphaltic still bottoms. No. 2,056,913. Hasson T. Terrell, Edward M. Hughes, and Philip L. Carter, Chester, Pa., to Sun Oil, Philadelphia.
Process for conversion of hydrocarbons into lighter hydrocarbons. No. 2,056,775. Carbon P. Dubbs, Wilmette, Ill., to Universal Oil Products Co., Chicago.
Apparatus for breaking up petroleum emulsions. No. 2,056,763. George S. Bays to Stanolind Oil and Gas Co., both of Tulsa, Okla.
Dewaxing hydrocarbon oils. No. 2,056,723. Eugene C. Herthel, Flossmoor, Ill., to Sinclair Ref. Co., N. Y. City.
Cracking petroleum hydrocarbons. No. 2,056,725. Orin G. Kaasa, Munster, and Thomas B. Kimball, Hammond, Ind., to Sinclair Ref. Co., N. Y. City.
Treatment of sour hydrocarbon oil. No. 2,056,618. Walter V. Overbaugh, Fishkill, N. Y., to The Texas Co., N. Y. City.
Conversion of hydrocarbons. No. 2,057,631. Jacque C. Morrell to Universal Oil Products Co., both of Chicago.
Refining cracked distillate in vapor state by treatment with hydrochloric acid and metallic oxides. No. 2,057,630. Jacque C. Morrell and Gustav Egloff to Universal Oil Products Co., all of Chicago.
Refining cracked distillate in liquid condition by treatment with hydrochloric acid and metallic oxides. No. 2,057,629. Jacque C. Morrell and Gustav Egloff to Universal Oil Products Co., all of Chicago.
Conversion of gaseous olefins into liquid hydrocarbons using a calcined mixture of pyrophosphoric acid and a solid adsorbent as catalyst. No. 2,057,433. Vladimir Ipatieff to Universal Oil Products Co., all of Chicago.
Process for alkylating hydrocarbons. No. 2,057,432. Vladimir Ipatieff and Aristid V. Grosse to Universal Oil Products Co., all of Chicago.
Refining cracked distillate by treating vapors with hydrochloric acid in presence of aqueous mercury salt solution. No. 2,057,424. Gustav Egloff and Jacque C. Morrell to Universal Oil Products Co., all of Chicago.
Destructive hydrogenation or organic materials. No. 2,057,402. Hans Tropsch to Universal Oil Products Co., both of Chicago.
Conversion of hydrocarbon oils. No. 2,057,401. Kenneth Swartwood to Universal Oil Products Co., both of Chicago.
Production of alcohol by hydrating corresponding olefine having at least one double bond in the molecule. No. 2,057,283. Adrianus Johannes van Peski and Siegfried Leonard Langedijk, Amsterdam, Netherlands, to Shell Development Co., San Francisco.
Production of cracked gasoline having low gum content. No. 2,057,268. Albert P. Sachs to Petroleum Conversion Corp., both of N. Y. City.
Manufacture of asphalt from petroleum residuum by treating with gas containing oxygen. No. 2,057,265. Herman I. Ringgenberg, Munster, Ind., to Sinclair Ref. Co., N. Y. City.
Tank for petroleum or other liquids. No. 2,057,248. Jean Peyrouze, Asnieres, France.
Gas analyzing process and apparatus. No. 2,057,246. John D. Morgan, South Orange, N. J., and Alan P. Sullivan, Long Island City, N. Y., to Doherty Research Co., N. Y. City.
Purification of solvents used in extraction of petroleum stocks. No. 2,057,113. Jack Robinson, East Alton, Ill., to Stand. Oil Co. (Ind.), Chicago.
Vapor phase cracking of hydrocarbons to produce a gasoline containing more than 25% aromatics. No. 2,057,007. Adrien Cambron and Colin Hahnemann Bayley, Ottawa, Ontario, Canada.
Method and apparatus for distillation of hydrocarbons. No. 2,057,004. Myron J. Burkhard, Ridgewood, N. J., to Socony-Vacuum Oil Co., N. Y. City.
Polymerization of hydrocarbon oils. Nos. 2,056,978 and 2,056,979. Rudolph C. Osterstom to The Pure Oil Co., both of Chicago.
Method and apparatus for transporting substantially gas free hydrocarbon liquids through pipe lines. No. 2,058,355. Arthur H. Riney and Lloyd T. Gibbs to Phillips Petroleum Co., all of Bartlesville, Okla.
Addition of triphenylphosphite, aryl phosphite, or tricresylphosphite to a lubricant which normally corrodes internal combustion engine bearings composed of cadmium and copper to inhibit corrosion. Nos. 2,058,342, 2,058,343, and 2,058,344. Robert C. Moran, Wenonah, and William L. Evers and Everett W. Fuller, Woodbury, N. J., to Socony-Vacuum Oil Co., N. Y. City.
Method and means of producing anti-knock fluid. No. 2,058,194. Albrecht von Groeling, Los Angeles, to Seth L. Roberts, Oakland, Calif.
Process of refining hydrocarbon oil involving the use of a molten alkali metal. No. 2,058,131. Paul J. Carlisle, Niagara Falls, N. Y., to du Pont, Wilmington, Del.
Oil refining process. No 2,057,923. Ernest J. Slater to Champlin Ref. Co., both of Enid, Okla.
Method of desulfurizing petroleum oils by treatment with an alkaline plumbite solution without addition of sulfur. No. 2,057,918. Charles M. Ridgway, Midland, Mich., to Pure Oil Co., Chicago.

Resins, Plastics, etc.

Method of treating plastic substances with an electric current. No. 2,054,937. John Kremer, Southport, Conn.
Polymerization product of the salt of a heterocyclic tertiary base and a polymeric carboxylic acid. No. 2,054,903. Max Hagedorn, Dessau in Anhalt, Germany, to I. G., Frankfort, Germany.
Stone-like veneer panel made of Portland cement, thermoplastic adhesive and veneer. No. 2,054,869. George Smolak, Somerville, N. J.
Apparatus for making laminated glass. No. 2,054,864. William Owen, Pittsburgh, Pa., to Pittsburgh Plate Glass Co. of Pennsylvania.
Producing differential color effects in thermoplastic material. No. 2,054,848. William Bowker, Newark, N. J., to Celluloid Corp. of N. J.
Production of cold molding composition. No. 2,054,815. Clarence A. Herbst, to Economy Fuse and Mfg. Co., both of Chicago.
Process for making urea-aldehyde condensation products. No. 2,056,142 Kurt Ripper, Vienna, Austria, to American Cyanamid Co., N. Y. City.
Preparation of a plastic from a metallic thiosulfate and a halogenated aliphatic hydrocarbon. No. 2,056,026. Douglas Frank Twiss, Wylde Green, Birmingham, and Albert Edward Toney Neale, Ward End, Birmingham, England, to Dunlop Tire & Rubber Corp., Buffalo.

Synthetic resin varnish. No. 2,055,953. Lloyd C. Swallen, Terre Haute, Ind., to Resinox Corp., N. Y. City.
Artificial leather manufacture. No. 2,055,635. Milton O. Schur to Brown Co., both of Berlin, N. H.
Preparation of resins and asphaltenes from residues of petroleum cracking. No. 2,055,486. Stephen C. Fulton, Elizabeth, N. J., to Stand. Oil Development Co., Delaware.
Polymerization of vinyl compounds with a catalyst in presence of materials of the group iron, steel and alloy steels. No. 2,055,468. Stuart D. Douglas, Charleston, W. Va., to Union Carbide and Carbon Corp., N. Y.
Rendering rug and carpet material fray proof by impregnation with a synthetic resin plastic. No. 2,055,464. Theodore J. Bowes to Andrew McLean Co., both of Passaic, N. J.
Preparation of a molded product from a cellulosic material and a synthetic resin. No. 2,056,810. Frederic H. Smyser, Marblehead, Mass., to G. E. Co., N. Y.
Preparation of molding compositions. Nos. 2,056,793, 2,056,794, 2,056,795, 2,056,796 and 2,056,797. Maurice L. Macht, Jersey City, and Alan F. Randolph, Montclair, N. J., to du Pont, Wilmington, Del.
Preparation of a resin from a mixed ester of an acidic gum, a polyhydric alcohol and adipic acid. No. 2,056,656. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., N. J.
Manufacture of molded articles from urea and formaldehyde. Nos. 2,056,461 and 2,056,462. Arthur M. Howald, Toledo, Ohio, to Plaskon Co., Del.
Preparation of formaldehyde urea resin. Nos. 2,056,455, 2,056,458 and 2,056,460. Arthur M. Howald, Toledo, Ohio, to Plaskon Co., Del.
Plastic material suitable for heat molding or as varnish resin. No. 2,056,459. Arthur M. Howald and James L. Rodgers, Jr., Toledo, Ohio, to Plaskon Co., Del.
Method of molding articles composed of urea formaldehyde resins and pre-felted fiber. No. 2,056,457. Arthur M. Howald, Pittsburgh, to Plaskon Co., Del.
Addition of benzoyl peroxide to urea formaldehyde resins to facilitate heat hardening. No. 2,056,456. Arthur M. Howald, Pittsburgh, to Plaskon Co., Del.
Preparation, hardening and molding of resinous materials. Nos. 2,056,453 and 2,056,454. Arthur M. Howald, Pittsburgh, to Plaskon Co., Del.
Molding powder. No. 2,056,442. Emil H. Balz, Pittsburgh, to Plaskon Co., Del.
Method of manufacturing molded articles from dry bulky molding powders. No. 2,056,436. James L. Rodgers, Jr., Toledo, Ohio, and Arthur M. Howald, Pittsburgh, to Plaskon Co., Del.
Process for producing hot molded articles. No. 2,056,280. Franz Kurath and Oscar A. Cherry to Economy Fuse & Mfg. Co., all of Chicago.
Resinous condensation product from the reaction of a polyhydric alcohol, a polycarboxylic acid of the aliphatic series, a weak polybasic inorganic acid, and an acidic phenol-aldehyde resin. No. 2,056,211. Israel Rosenblum, Jackson Heights, N. Y.
Method of preventing the adherence of stacked sheets of plasticizing material. No. 2,057,548. Roger N. Wallach, Briarcliff Manor, N. Y., and Rene Schwarz, Fredericksburg, Va., to Sylvania Industrial Corp., Fredericksburg, Va.
Material for making inlays in wood comprised of vinyl resin, ester gum, a volatile solvent and one-hundred mesh wood flour. No. 2,057,882. Clyde A. Crowley, Chicago.
Preparation of dispersed gelled resins. No. 2,057,766. Merlin Martin Brubaker to du Pont, both of Wilmington, Del.
Polyhydric alcohol-polybasic acid resins. No. 2,057,765. Merlin Martin Brubaker to du Pont, both of Wilmington, Del.
Insulation for electrical conductor composed of polymerized vinyl acetate, plasticizer and a compatible resin. No. 2,057,690. William Henry Moss, London, England, to Celanese Corp., Del.
Insulation for electrical conductors composed of a cellulose derivative whose surface is covered with a vinyl compound. Nos. 2,057,688 and 2,057,689. William Henry Moss, London, England, to Celanese Corp., Del.
Synthetic resin. No. 2,057,676. George DeWitt Graves to du Pont, both of Wilmington, Del.
Mica flakes cemented together with urea resin. No. 2,057,672. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., N. J.

Rubber

Preservation of rubber. No. 2,055,812. David J. Beaver, Nitro, W. Va., to Monsanto Chem. Co., Wilmington, Del.
Rubber treating process and product thereby obtained. No. 2,055,806. Robert L. Sibley, Nitro, W. Va., to Monsanto Chem. Co., Wilmington, Del.
Removal of natural occurring alkaline-earth metals from fresh latex by treatment with an alkali zeolite. No. 2,056,569. Robert W. Eldridge, Nutley, N. J., to U. S. Rubber Co., N. Y. City.
Production of porous chlor-rubber bodies. No. 2,057,442. Franz Mik to Deutsche Gold-und Silber Scheideanstalt, vormals Roessler, both of Frankfort, Ger.
Production of pulps containing rubber substances. No. 2,057,331. Harry C. Fisher, Cincinnati, and George Acus, Arlington Heights, Ohio, to The Richardson Co., Lockland, Ohio.
Process for chemically creaming latex. No. 2,058,247. John McGavack, Leonia, N. J., to U. S. Rubber Co., N. Y. City.
Direct bonding of rubber to metal. No. 2,058,246. Willett J. McCortney, Royal Oak, Mich., to Chrysler Corp., Detroit, Mich.
Apparatus for forming threads from natural or artificial rubber dispersions. No. 2,058,032. Edward Arthur Murphy to Dunlop Rubber Co., both of Birmingham, England.
Process for forming surface finishes using rubber dispersions. No. 2,058,031. Edward Arthur Murphy to Dunlop Rubber Co., both of Birmingham, England.
Manufacture of rubber-bonded abrasive articles. No. 2,057,733. Royce J. Noble, Malden, Mass., to Heveatex Corp., Melrose, Mass.
Production of flexible hardened slip-finishes on rubber surfaces by treatment with concentrated sulfuric acid and a water-soluble aliphatic alcohol. No. 2,057,717. Roscoe H. Gerke, Nutley, N. J., to U. S. Rubber Co., N. Y. City.
Adhesive and coating composition with a rubber base. No. 2,057,715. Harry L. Fisher, Leonia, N. J., to U. S. Rubber Co., N. Y. City.

Textile, Rayon

Continuous process of producing synthetic threads. No. 2,055,292. Glen S. Hiers, Bala-Cynwyd, Pa., to Collins & Aikman Corp., Philadelphia.
Process for treating fabric with transparent composition of wax nitrocellulose and rubber. No. 2,055,019. William B. Serrington, Boston, Mass.
Method for making cellulose fabric adhesive and apparatus for application of fabric. No. 2,054,944. Carl A. Newhall, Peabody, Mass., to United Shoe Machinery Corp., Paterson, N. J.
Manufacture of mixed fabrics of cellulose derivatives. No. 2,054,913. Andreas Ruperti, to Society of Chemical Industry in Basle, both of Basel, Switz.
Method and apparatus for preparing straws, tapes, bands etc., of cellulose derivatives. No. 2,054,786. Jean Marie Alibert, Lyon, France, to du Pont Rayon Co., N. Y. City.
Method of cleaning fabrics by humidifying and cleaning with a dry cleaning solvent in the presence of the added moisture. No. 2,056,141. Latimer D. Myers to Emery Industries, Inc., both of Cincinnati.
Method of finishing fibrous materials, metal or wood surfaces. No. 2,056,114. Walther Schrauth, Berlin-Dahlen, Ger., to du Pont, Wilmington, Del.
Fabric filter. No. 2,055,872. Fred W. Manning, Altadena, Calif., to F. W. Manning Co., Los Angeles.
Manufacture of cords composed of textile threads and rubber. No. 2,055,821. Caspar Fredrik Hansen, Oslo, and Erling Meier, Skoyen near Oslo, Norway.
Modification of animal silk by treatment with an aqueous acid-reacting inorganic material. No. 2,056,271. Georges Heberlein, Wattwil, Switz., and Walter Elsaesser, Ridgewood, N. J., to Heberlein Patent Corp., N. Y. City.
Purification of natural fibers by treatment with hexametaphosphate. No. 2,056,185. Oscar Casey Greene, Forest Hills, N. Y., to Tropical Products Corp., N. Y. City.
Delustering silk by treatment with a soluble stearate and a colloidal mineral and thereafter with a rare earth metal acetate. No. 2,057,469. William H. Alton, N. Y. City, and Hilton Ira Jones, Wilmette, Ill., to R. T. Vanderbilt Co., N. Y. City.
Manufacture of textile yarns and the production of fabrics thereof. No. 2,057,363. Joseph Brandwood, Southport, England.
Production of artificial silk by spinning can method. No. 2,057,324. Benno Borzykowski, Paris, France, to Borvisk Syndicate Ltd., London, England.
Production of dull finish artificial silk by adding dissolved proteid and barium hydroxide to viscose. No. 2,057,323. Benno Borzykowski, Paris, France.
Process for bleaching animal fibers. No. 2,057,296. Constantine F. Fabian, Brookfield, Conn., and Alexander N. Sachanen, Luxembourg, Luxembourg, to The Non-Mercuric Carrot Co., Danbury, Conn.
Production of filaments, threads, etc., from cellulose derivatives. No. 2,057,141. Arthur Eichengrün, Charlottenburg, Germany, to Celanese Corp. of America, Del.
Colored fire-resistant fabric composed of asbestos cloth and paint containing 3-chlor-2-hydroxy-diphenyl. No. 2,058,120. William L. Wirbelauer, Paterson, N. J., to Johns-Manville Corp., N. Y. City.
Process for making air impervious sheet material by coating a sized fibrous web material with aqueous solution of gelatine and sulfonated castor oil. No. 2,058,021. Edouard M. Kratz, Gary, Ind., to Marbo Products Corp., Chicago.
Process for producing colored resists under aniline black by using a paste containing an ester salt of a leuco-vat dyestuff, alkali salt of a non-volatile organic acid and aluminum chlorate. No. 2,057,862. Hans Tschumi, to Durand & Huguenin A. G., both of Basel, Switz.
Manufacture of a pile fabric with aid of vulcanized rubber and wax. No. 2,057,831. Glen S. Hiers, Cynwyd, Pa., to Collins & Aikman Corp., Philadelphia.
Process for imparting a non-shrinking linen-like finish to a textile containing vegetable fibers by treatment in an alkali-lye bath. No. 2,057,822. Fritz Drechsel, Munich, Ger.
Production of artificial filaments having a modified lustre from spinning solution containing an insoluble organic substance in gelatinous or flocculent form. No. 2,057,712. Henry Dreyfus, London, England.
Production of artificial filaments from viscose. No. 2,057,711. Henry Dreyfus, London, England.

Water Treatment

Process and apparatus for purification of water with ozone and an ultrafilter. No. 2,055,808. Justin F. Wait, N. Y. City.
Water filter and purifier containing layers of gravel, activated carbon and anthracite coal. No. 2,057,237. Lance H. Hoop, Denver, Colo.
Method of drying and destroying municipal wastes. No. 2,057,681. Joseph Harrington, Riverside, Ill.

The Literature

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Petroleum. "Ammonia in Petroleum Refining." Comparatively new uses for ammonia in refinery practice are being found, particularly in combating corrosion and neutralizing pressure distillate. Article is based on investigations made by the Barrett Co.'s Technical Service Bureau. *The Petroleum Times*, Sept. 26, '36, p393.
Research. "Organization of Information for Industry," R. Brightman, (librarian, I. C. I.). The library has become a valuable adjunct of the larger chemical companies. Author describes the function and the mechanics of operating an industrial and research library. *The Industrial Chemist* (British), September, '36, p396.
Raw Materials. Williams Haynes reveals to the farmer the bright possibilities of turning surplus crops and acreages to the production of raw materials for industry; shows the farmer that he can follow the example of the chemical manufacturer who has increased his profits by increasing production and lowering prices. A very practical discussion of the farm chemurgic movement. *The Country Home Magazine*, October, '36, p11.
Rubber. "Kaysam—A Casting Process for the Manufacture of Rubber Products From Latex," David Roy Cutler (Rubber-Gel Products, North Quincy, Mass.). Method of casting latex into various commercial rubber articles has attracted wide attention. Author discusses method and its advantages. *India Rubber World*, October, '36, p35.
Resins, Plastics. *Industrial & Engineering Chemistry* presents in the October issue a symposium on the various resins and plastics. Country's outstanding technicians in these fields participated.

The Chemistry and Manufacture of Synthetic Acetic Acid

By Dr. O. Zahn

AFTER the World War demand for acetic increased owing to the introduction of acetate rayon and other materials produced from acetyl cellulose, and consequently large-scale plants for the manufacture of synthetic acetic acid are to-day in operation in all industrial countries.

In all these plants, acetic acid is produced from acetylene in 2 distinct operations; 1st, the hydration of acetylene to acetaldehyde

$$C_2H_2 + H_2O = C_2H_4O,$$

and 2nd, oxidation of the acetaldehyde to acetic acid

$$C_2H_4O + O = C_2H_4O_2.$$

Formation of acetaldehyde by the addition of water to the acetylene molecule was 1st published by Kutscheroff in 1881 and was confirmed in 1898 by Erdmann and Köthner, who recognized that it is a catalytic reaction which proceeds in the presence of mercury salts. K. A. Hofmann at the same time carried out investigations with a view to clearing up the reaction.

An excess of acetylene is added to dilute (10 to 40%) sulfuric at from 40 to 80° C. Reaction may be carried out in a vessel fitted with a stirrer, or in a tower of acid-resistant metal, stoneware, or iron lined with an acid-proof coating. Catalyst is always mercury, either as metal or in the form of oxide, in the presence of an oxidant. Mercury oxide dissolves in the liquid to form sulfate, which in turn reacts with acetylene to form a white precipitate of trimercuric aldehyde, which is reconverted by more strongly concentrated acid and heat into mercury salt and acetaldehyde. The mercury salt is simultaneously reduced, so that a sludge of metallic mercury is deposited which must be re-oxidized to mercury oxide, either electrolytically or by means of nitric acid.

The excess acetylene leaves the reaction vessel charged with vapors of acetaldehyde, which boils at 20.8° C. It is then cooled, freed from the acetaldehyde, which readily dissolves in water, by washing it in a scrubbing tower or otherwise, and is finally returned to the reaction apparatus with the addition of fresh gas.

The acetaldehyde solution contains from 12 to 25% of acetaldehyde, depending upon the extent to which the reaction is carried out and the temperature of the washing water. Technically pure acetaldehyde, containing traces of water, croton aldehyde, and acetic acid, is obtained from the solution by rectification, and is then oxidized to acetic acid. Traces of mercury compounds are entrained by the aldehyde during this operation and must be removed from the acetic acid by means of an oxidant, such as permanganate, when the acid is intended for human consumption.

Conversion of acetaldehyde to acetic acid is very much simpler than the hydration of acetylene. Acetaldehyde and oxygen combine directly and approximately quantitatively in the presence of a manganese catalyst to form acetic acid of about 97% strength. Reaction is carried out in a vessel made of some acid-proof alloy or stoneware, and with a reflux condenser which condenses the acetic acid escaping with the waste gas. Quantity of the waste gas depends on the purity of the oxygen used. Recovery of acetic acid from the waste gas is more difficult when air is used instead of oxygen, because higher pressure is then required for the oxidization; when oxygen is used, little more than atmospheric pressure will suffice to convey the acetaldehyde and oxygen to the reaction vessel.

Although the oxidation of acetaldehyde to acetic acid may appear to be quite a simple process, especially when oxygen is being used, the operation nevertheless calls for certain precautionary measures and a great deal of experience. Peracetic acid, which is explosive, is 1st formed by the oxidation:

(1) $\underset{\text{acetaldehyde}}{CH_3COH} + O_2 = \underset{\text{peracetic acid}}{CH_3CO_3H}$

(2) $\underset{\text{peracetic acid}}{2CH_3CO_3H}$ heating $= \underset{\text{acetic acid}}{2CH_3COOH} + O_2$

(3) $\underset{\text{acetaldehyde}}{2CH_3COH} + O_2$ (set free from 2) $= \underset{\text{acetic acid}}{2CH_3COOH}$

In order to eliminate the risk of explosion as far as possible, the oxidation must always be carried out within a temperature range of from 20 to 80° C. Reaction vessel must be capable of being cooled, as well as heated. Oxidation is best kept under control by diluting the acetaldehyde, for which purpose the most suitable diluent is the concentrated acetic acid that is formed. Oxidation can be carried out either continuously or at intervals; a small quantity of the reaction mixture dissolved in the acetic acid will always be left behind in the reaction vessel.

Methyl acetate, water, and formic acid are formed as by-products. When 99.5% oxygen is used, the composition of the reaction product is approximately:

Acetic acid	97—98 %
Methyl acetate	1—2 %
Water	1—2 %
Formic acid	0.2—0.5%
Acetaldehyde	traces

The yield is about 95% both in the hydration process as well as in the oxidation process.

The production of acetaldehyde and acetic acid is attended with danger. Tendency of acetylene to explode is well known; acetaldehyde is very flammable. In the presence of small quantities of acids or bases, acetaldehyde tends to polymerize with a considerable evolution of heat. Mercury can only be handled with suitable precautions from a hygienic point of view. Decomposition of any large quantity of peracetic acid takes place explosively.

These dangers have been successfully eliminated by careful design of the equipment based on many years' experience, and by very accurate chemical control of all stages of the process. The operatives must be thoroughly experienced, because a series of separate processes has to be carried out which are then combined to produce a single effect. The manufacture of synthetic acetic acid embraces the following steps:—(1) The production of acetylene from calcium carbide; (2) the conversion of acetylene into acetaldehyde; (3) the production of oxygen by the liquefaction of air; (4) the conversion of acetaldehyde into acetic acid; (5) the refining of crude acetic acid for the production of glacial acetic acid, various grades of dilute acetic acid for use in the arts, and table vinegar; and (6) the recovery of mercury oxide. Dr. O. Zahn, *Engineering Progress* (Germany), August, '36.

Removal of Salt In Caustic Production

One of the most widely-used methods of removing sodium chloride impurities from electrolytic caustic soda solutions depends on the addition of sodium sulfate or a compound forming sodium sulfate to concentrated caustic soda solutions in order to form with the sodium chloride a complex salt insoluble in

the caustic soda solution. In such a process pulverized anhydrous sodium sulfate is added to a caustic soda solution containing sodium chloride, the mixture boiled for 45 minutes, allowed to cool to room temperature, and the precipitated solid product removed by settling or filtration. It is understood, however, that the complex salt formed by the above method is relatively fine, and difficulty is encountered in separating it out.

According to a process discovered by chemists of Penn. Salt Mfg. Co., concentrated caustic soda solutions containing sodium chloride are purified by a method which comprises heating the solution to be purified to a temperature of at least 60° C., preferably about 70—80° C.; addition sodium sulfate thereto, in sufficient quantity to react with part or all of the sodium chloride present, to form an insoluble complex salt comprising sodium chloride and sodium sulfate; mixing until the reaction is substantially complete; cooling to a temperature about 30° C.; slowly agitating until the super-saturated solution is substantially completely broken down; and separating the solution from the suspended solids, by settling or decantation or by filtration.

The addition of the sodium sulfate to the hot liquor, the hot mixing, the cooling, and the cold mixing all co-operate to give relatively large crystals, and the cooling and cold mixing cause the supersaturated solution of sodium sulfate and complex salt to be broken down with the consequent precipitation thereof, so that both are removed subsequently in a single separating operation. Addition of finely divided crystals of sodium sulfate, either in powder form or suspended in concentrated caustic soda solution, is, it is stated, desirable since a complete reaction is assured with no waste of sulfate and no inaccuracy in control.

A further feature of the process consists of the additional step of treating the complex salt separated from the caustic soda solution with a selective solvent in such proportions with respect to the amount of complex salt, that sodium chloride is to some extent at least dissolved therefrom, leaving at least some of the sodium sulfate of the complex salt undissolved.

The process, which may be operated either as a batch method or as a continuous process, is particularly applicable for treatment of solutions of caustic soda containing 36% to 39% Na_2O (by weight) which have been evaporated to this concentration from lower concentrations and from which the impurities, as far as possible, have been removed by crystallization thereof.

Citric Acid Dehydration Products in Synthetic Resins

Research on the synthetic resins of the alkyd type has revealed the potential importance of citraconic and itaconic acids and their anhydrides as raw materials. These last-mentioned materials have hitherto been obtained by the pyrogenic decomposition of crystalline citric acid. Small quantities of the crystalline citric acid are heated, and the decomposition products which distill over are collected. Yields obtained by this method of working have not been very satisfactory. As stated by Fittig in the *Annalen der Chemie* (Vol. 188, p72), 217 grams of citraconic anhydride can be obtained from 1,000 grams of citric.

According to a recent discovery of C. H. Boehringer Sohn A.-G., of Nieder-Ingelheim, Germany, substantially better yields of citracinic acid and itaconic acid are obtained by using not crystalline citric acid, but a concentrated solution of citric acid and allowing this solution to drop into a preheated vessel. The occurrence of inter-molecular reactions and the resulting formation of reaction products other than citraconic acid and itaconic acid are prevented by the dilution employed for the citric acid and by the immediate superheating without previous, long-continued heating up to the reaction temperature.

For carrying out the process a concentrated aqueous citric-acid solution is allowed to run into an evacuated distillation apparatus heated to 230° C. or still higher. Rate at which the solution is allowed to run in is regulated in accordance with the rate of the distillation of the reaction products which consist of a mixture of citraconic anhydride and itaconic anhydride.

Residues remaining in the distillation vessel are very slight. They are mainly the non-volatile impurities of citric acid, together with only small amounts of carbonized decomposition.

Since itaconic anhydride, especially at higher temperatures, is converted into citraconic anhydride, by re-arrangement, the quantitative proportions of the 2 corresponding isomers depends upon the temperature and the apparatus employed. The free acids are obtained by heating the mixture of citraconic anhydride, itaconic anhydride and water which is 1st obtained. Hydration of the anhydrides even takes place partly during the condensation of the distillation products. By means of fractional condensation, however, the anhydrides themselves may also be obtained in a good yield.

In an example given in the English Patent specification (No. 452, 460, '35) 2 kilogs of citric acid are dissolved hot in 800 cc. of water. Solution is allowed to run into a copper vessel of about 5 liters capacity at an oil-bath temperature of 280° to 300° C. and a vacuum to 30 or 40 mm. of mercury, the rate at which the solution is allowed to run into the vessel being regulated so that the pressure does not rise above 40 mm. of mercury. With the apparatus employed, the running in of the citric acid solution lasts 4 hours. Distillate obtained amounts to 2,300 grams. After heating the distillate to dissolve the partly oily and partly crystalline anhydride, solution contains 95% of the theoretical yield of dibasic acid. About 84% of this is itaconic acid and the remainder is citraconic acid. *Chemical Trade Journal* (British), Sept. 25, '36, p260.

Revolutionary Method of Analysis

With a photoelectric tube substituted for the human eye, the recently developed spectrophotometer, applied as a new tool of analytical chemistry has been able to "see" and accurately estimate the quantity of as little as two millionths of a gram of material present in a 25 cc. sample. The "seeing" detector, though costing several thousand dollars, will be a valuable addition to the microchemist's laboratory since in many cases it can give quantitative values in analyses which have before been capable of determination in a qualitative way only. The presence and amount of almost any element which will form a colored compound when combined with some reagent can be determined by the spectrophotometer.

Fire Risk of Chlorates Reduced

Fire risks attending use of alkali chlorates can be greatly reduced by the addition to the chlorate of one or more alkali metal carbonates or bicarbonates, specially sodium carbonate, either alone or in conjunction with one or more chlorides of alkali metals, specially sodium chloride. Such addition is said to have a highly retarding effect on the combustion of organic substances impregnated with chlorates. Process was worked out by the Stockholms Superfosfat Fabriks A.-B. of Stockholm, Sweden, and is disclosed in the English Patent, No. 451,894, '35.

Continuous Type of Hydrogenation Test Plant

Hydrogenation tests on coal were made in a small autoclave using a simplified procedure which did not entail a continuous flow of materials through the autoclave. Although this type


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of apparatus is comparatively easy to operate, the results are not the same as those obtained when the flow of materials is continuous, as it would have to be in a large scale plant. For this reason experiments were begun with a continuous type of apparatus, and after a good deal of development work a satisfactory testing plant has been evolved. This plant is a small one which treats only one gallon of raw material per hour.

Procedure for coal liquefaction as employed in this testing plant is fairly simple. Powdered coal is mixed with heavy oil and a small amount of tin oxide, which aids the reaction, and the mixture is pumped into the reaction chamber. Reaction chamber is a vertical pipe made of thick alloy steel in order to resist combined high temperature and pressure. In it the charge is heated to about 840 °F. and treated with hydrogen at a pressure of 3000 lbs. per square inch.

Charger passes upward through the chamber and is stirred by the action of the hydrogen which is introduced in excess so that some of it bubbles through the charge. Product, which is removed from the top of the chamber, is cooled and separated from the excess hydrogen which is then recirculated through the system.

Liquid product is an oil from which crude gasoline may be distilled. It also furnishes the heavy oil which is used for mixing with the coal for a subsequent charge. Process is, therefore, self-contained and does not require an outside source of oil. Using this method a suitable coal yields about 78% of crude oil, 16% of gas, 6% of solid residue, and 8% of water. Hydrogen consumed amounts to 8% of the coal charged. These yields are on the ash-and-moisture-free basis.

In operating the equipment it is necessary to control the temperature and rate of charging very carefully, because the reaction is influenced by relatively small changes in these conditions. However, the reaction is not highly sensitive to changes in pressure. Dr. T. E. Warren, Dr. R. E. Gilmore, Fuel Research Laboratories, Canadian Dept. of Mines, before recent A. C. S. Meeting in Pittsburgh.

Activated Carbon Purifies Hydrochloric Acid

Activated carbon can be used successfully in hydrochloric acid gas purification by use of the following procedure: The gas from crude acid obtained by reaction between sulfuric and salt or that from commercial hydrochloric is 1st passed at ordinary temperature through a column packed with cold activated carbon which retains iron and arsenical impurities. It then flows through an electric furnace (exit temperature of the gas not less than 250° C.) likewise filled with activated carbon where any sulfuric carried over is largely decomposed. To complete the elimination of sulfuric, the gas is finally passed through a vessel containing both activated carbon and highly concentrated hydrochloric. It is reported that no more than 500 grams of activated carbon are required for a daily output of 50 kilos of hydrochloric for a period of one month. Rate of gas through the electric furnace should not be more than about 2 cc. per second. J. Khim. Prom., Vol. 12, No. 9, p. 924 (T. V. Polianski).

Glycerine Made from Saccharine Materials

The Chemical Division, Bureau of Foreign & Domestic Commerce reports that the production of glycerine by fermentation of saccharine materials is close to the operative stage in a plant near Padua, Italy. The Luedecke patents are being used but no data on cost or the practicability of the process have been released.

Lactic from Whey Demonstrated

Chemists of the U. S. Bureau of Dairy Industry demonstrated methods developed for production of lactic acid and related chemicals from whey at the Dairy Industries Exposition at Atlantic City during the week of Oct. 12-17th. A large dairy organization is now making lactic acid and calcium lactate from whey. Recently bureau scientists have shown how lactic acid may be concentrated to a greater degree than it is at present. Instead of an acid containing from 50 to 75% water, plus some impurities, producers are now enabled to make an acid containing no water and fewer impurities. This applies to acid made from the usual materials, molasses, corn starch, etc., as well as that made from whey.

Heat Transfer Mediums Studied

Mixtures of tetrachlorobenzene, trichlorobenzene, dichlorobenzene, α-chloronaphthalene, diphenyl, etc. show satisfactory characteristics as a heat transfer medium in laboratory and small scale operative comparisons. Suitable selected mixtures are liquid from—50° to 200°. Change of viscosity is moderate over this range as compared with competitive fluids. There is no appreciable corrosive effect on metals, even at high temperatures, in the presence of moisture. Evaporation at room temperature is slight. Mixtures are non-inflamable over the range to above their boiling points. They do not polymerize or sludge at high temperatures. Metal hose can be used for temporary connections. Foster D. Snell, A. C. S. Meeting, Pittsburgh.

Iso-Propyl Alcohol Produced from Propylene

Iso-propyl alcohol of high strength has been produced by the direct high pressure hydration of propylene gas with water in the presence of a dilute phosphoric acid catalyst. Investigation has been studied over a pressure range of 95 to 503 atmospheres and a temperature range of 160 to 360° C. Rate of the reaction has been studied and the equilibrium determined for each of these conditions. In addition to the iso-propyl alcohol, iso-propyl ether and polymer were formed as by-products. The boiling range of polymer changed markedly as the pressure and temperature increased. Majewski, Marek, Rohm & Haas, A. C. S. Meeting, Pittsburgh.

Propane is an Effective Dewaxing Agent

Liquid propane is a cheap, available, safe and versatile solvent for dewaxing, deasphalting, and refining heavy lubricating oils. At low temperatures its properties are such that wax can be quickly and completely removed; at high temperatures, due to rapid changes in its physical properties, it may be used to precipitate various undesirable constituents, since it tends to eliminate all those compounds which the refiner wishes to remove from his raw lubricating stock.

Propane refining makes readily available as by-products a whole series of high-melting-point waxes and petrolatums of extremely high quality and new types of asphalt of unusually desirable emulsification properties, as well as excellent ductility penetration relations. Unquestionably these products will make themselves felt commercially in the near future. *Industrial & Engineering Chemistry,* September, '36, p1065.

New Ethylene Glycol Process in Sweden

New method for production of ethylene glycol, developed in Sweden, is based on the oxidation of ethylene with oxygen under the catalytic influence of iodine. Details of process are not given. British, *Chemical Trade Journal,* Sept. 11, '36, p218.

Adiabatic Drying Described

A process of drying in air is described in which the heat required for drying the product is produced by adiabatic absorption from the discharged air from the dryer of the moisture given to it. The air being thus dried and heated is returned for re-use. The absorbent used is a concentrated solution of lithium chloride of controlled density. In this process drying efficiency of the order of a hundred and fifty per cent. are found in practice. This process allows complete control of drying temperatures and humidities and is applicable at the lowest commercial drying temperature up to at least hundred and fifty degrees Fahrenheit. It is applicable both to batch and continuous drying. F. R. Bichowsky, Surface Combustion Corp., A. C. S. Meeting, Pittsburgh.

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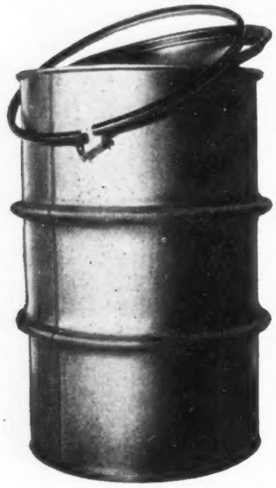

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I. C. C. Revises Regulations on Dangerous Articles

I. C. C. has revised several of the regulations applying to freight, express, and highway transportation of dangerous articles. Revisions affect a number of regulations issued from May 12, '30 to March 12, '36 and become effective on Dec. 7, '36. Outstanding features of the revised rules are:

Compressed gases.—Tankcars other than 106A permitted for liquefied hydrocarbon or petroleum gases if lading is pumped directly to adequate, permanent storage; they must have liquid and vapor eduction lines equipped with check valves.

Cyanides.—Exemption under paragraph 462(c) (March 12, '36) provided for cyanides and cyanide mixtures in tightly closed glass or earthenware, or metal inside containers, securely cushioned and packed in outer containers of wood or fiberboard; net weight limited to 5 lbs., except that 25 lbs. may be shipped in boxed or barreled metal containers (2F).

Empty carboys.—Highway regulations, paragraph T-16 (b) (Nov. 6, '34) amended to require empty carboys to be thoroughly drained.

Hydrofluoric acid.—Packing of anhydrous acid required to be in cylinders (4B), steel barrels or drums (5A), tankcars (104A, 105A, ARAIVA).

Inflammable liquids.—Exception from labeling when packed as follows:

(a) When flashpoint is about 20° F.: In containers of over 16 oz. avoirdupois and not over 1-quart capacity each, properly packed in outside specification containers as prescribed herein.

(b) Paint, varnish, and other articles listed in paragraph 249: In glass or earthenware vessels not over 1 gal. capacity each, or metal cans not over 5-gals. capacity each, properly packed in outside specification containers as prescribed herein.

Methyl chloride.—List of permitted cylinders given.

Nitrates.—Exemptions authorized under paragraph 278 (g) (March 12, '36) for nitrate of ammonia, barium, lead, potash, soda, and strontium, nitrcoarbo nitrate, and other inorganic nitrates in metal cans in outside fiberboard or wooden boxes; in wooden boxes, kegs, barrels, metal cans, or drums; calcium nitrate in bags.

Nitric acid.—Straight-side carboys required; boxed carboys (1A, 1C) permitted when specific gravity does not exceed 1.43; cushioning to be of incombustible mineral material, elastic wood strips, or whole cork.

Soda hydrosulfite.—Packing permitted in plywood drums (22B) with inside metal drums.

Sulfur trioxide.—Classification as corrosive liquid in dangerous articles list; no exemption from regulations. Glass or earthenware containers of not over 1 gallon required—they must be boxed—metal drums (5A) up to 55 gallons permitted.

Sulfuric acid.—Soft-rubber gaskets authorized on boxed carboys for acid of not over 1.4 specific gravity.

Stainless Clad Steel Containers Announced

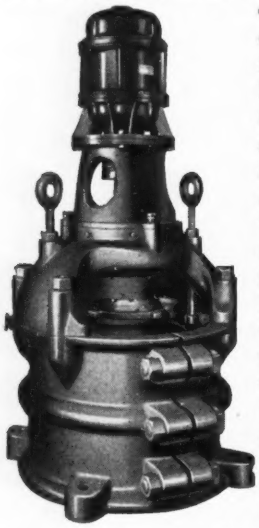
Stainless clad steel shipping containers have recently been announced by Stevens Metal Products Co., Niles, Ohio. This company realized that to satisfy a demand for a moderately priced drum that offers complete corrosion resistance to food products, intermediates, acids, solvents, pharmaceuticals and various other materials, it was necessary to seek a less costly material than solid stainless steel, nickel or other alloys, and after considerable research selected IngAclad stainless clad steel, a product of the Ingersoll Steel & Disc Division of the Borg-Warner Corp., Chicago.

IngAclad, which has a 20% layer of 18-8 stainless steel inseparably bonded to soft steel, has been adapted by Stevens to various types of shipping containers in capacities from 10 to 110 gals. IngAclad drums by Stevens are now available in solid and removable head drums with I bar or pressed out rolling hoops, and bilge barrels with locking removable head. They are made to comply with I.C.C. 5, 5B and 6B regulations and may be had in thicknesses of metal from 18 gauge to 12 gauge, as required. Complete specifications and descriptions of these stainless clad steel drums are attractively set forth in a recent 8-page folder entitled "IngAclad Drums and Barrels by Stevens," which is available upon request.

New Equipment

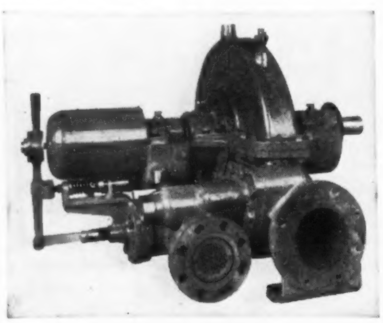
New Principle of Pulverizing QC 398

The Centriflex Pulverizer, is said to be a new and more efficient type of gyratory pulverizer utilizing a patented floating centrifugal eccentric. This new machine can be used to crush or pulverize all refractory materials with very little power. Like the ordinary gyratory pulverizer, the Centriflex consists of a cone shaped mantle enclosing a cone shaped muller, in the center of which is a rotating crank. The muller does not revolve with the crank but swings freely, pulverizing material against the mantle. Instead of a positive connection between the crank and muller as in the ordinary gyratory pulverizer, there is a yielding link—a patented floating centrifugal eccentric. As the crank shaft revolves, the resistance of the material, the action of the bumper on the crank, and the centrifugal force on the eccentric combine to oscillate the eccentric on the crank. This greatly multiplies the number of blows struck by the muller against the mantle, and the resulting rapid impact and rebound reduce the material to fine sizes.



Improved Line of Turbines QC 399

For driving general purpose machinery in industrial plants, a new and improved line of turbines is announced. They are of the impulse type having one pressure and 2 velocity stages, are built in capacities ranging approximately from 5 to 500 h.p., at turbine speeds of 1000 to 5000 rpm. Suitable for use with steam pressures up to 650 lbs. gauge and for total temperatures up to 750 deg. F., they may be operated either condensing or non-condensing with rotation in either direction Applications suitable for these turbines include: Acting as reducing valves between the boilers and the various process pressure requirements, they supply steam and produce by-product power at low cost in oil refineries, chemical plants, sugar mills, breweries, paper mills, and a host of other industries. Inherently free from the danger of fire they are ideal for service in oil refineries, chemical plants, etc.



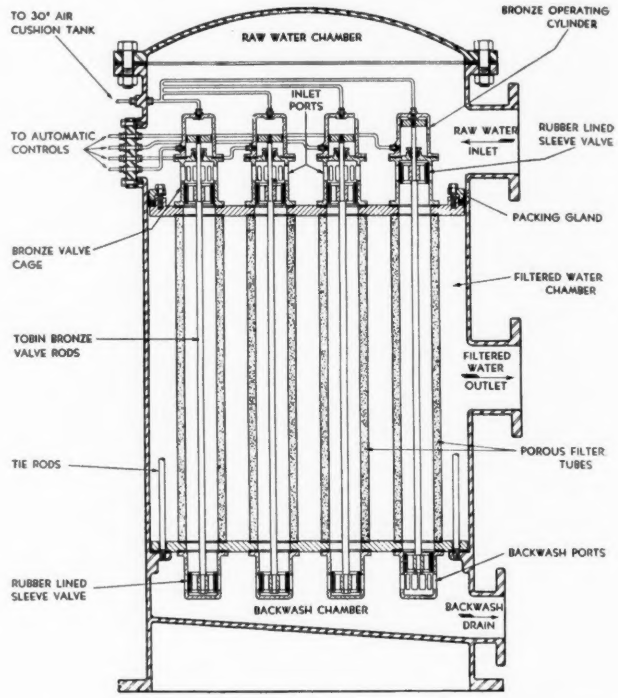
Single Stage Steam Compressor QC 400

A new single stage steam driven horizontal compressor for steam pressures 80 to 250 lbs., air pressures up to 150 lbs., sizes 279 to 1987 CFM has been announced. It is a heavy duty single cylinder double acting unit for either air or gas compression. The steam cylinder is placed in tandem with the air cylinder next to the frame and is heavily lagged for steam economy.

Further Details on Automatic Water Filter QC 401

Very briefly last month this department referred to the revolutionary development of an automatic water filter which produces a continuous flow of filter water with automatic elimination of solids.

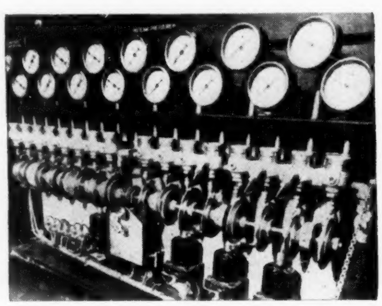
More detailed information is now available. Purpose of the automatic filter is that of producing a continuous flow of filtered water of such clarity as to meet each particular condition of



service. Filter tubes may be supplied in various porosities, allowing for a degree of filtration from crystal-clear water to .0039 inches diameter solids. Through new design impurities are automatically eliminated every 3 minutes by controlled back-wash of 10 seconds. Cycle of cleaning may be varied from 3 minutes to whatever time element may be required for the character of the water being filtered. Smallest type built involves 5 filter tubes so that when one tube is in back wash position the water necessary for back washing is supplied by the other 4 filter tubes. Manufacturer has prepared detailed technical data on this piece of equipment.

Complete Automatic Control QC 402

A new system, known as the Coordinated Control System, for automatically operating all technical operations and factors of an industrial process has been announced, which makes it possible to put even the most intricate scientific process under complete automatic control, eliminating the necessity of leaving the control of critical operations in the hands of operatives.



Chemical Industries,
149 Temple St., New Haven, Conn.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 398
" 399
" 400

QC 401
" 402

Name...

Title........................Company........................

Address...

Booklets & Catalogs

B91. The Bakelite Corp., 247 Park ave., N. Y. City. *Bakelite Review* for October again calls attention to the new and novel uses for Bakelite molded products and resins.

B92. City Chemical Corp., 132 W. 22nd st., N. Y. City. Company has just released new catalog, listing more than 10,000 items.

B93. Commercial Solvents Corp., Terre Haute, Ind. *Alcohol Talks* for September deals with alcohol and the food industries, principally the preparation of food.

B94. E. I. du Pont de Nemours & Co., R. & H. Chemicals Dept., Wilmington, Del. A manual giving in detail methods for the application of sodium cyanide solutions in the preparation of metal surfaces is ready, giving a general outline for the various methods used in treating metal surfaces with specific information regarding the use and handling of sodium cyanide in that field.

B95. E. I. du Pont de Nemours & Co., R. & H. Chemicals Dept. The Quarterly Price List (with an October dating) is valuable to chemical buyers with the active contract season now under way.

B96. Electro Bleaching Gas Co., 60 E. 42nd st., N. Y. City. *The Pioneer* is an interesting and instructive house-organ of value to all using chlorine or alkalies.

B97. Engineering & Licensing Corp., 40 S. Clinton st., Chicago. Booklet describes "Sealkote" as a protective paper coating material, tells where to use it, discusses the general, protective and decorative values added by its use.

B98. Fritzsche Brothers, Inc., 76 9th ave., N. Y. City. October price list of essential oils, flavors, aromatic chemicals, etc.

B99. Innis, Speiden & Co., 117 Liberty st., N. Y. City. *Isco News* is a bulletin of worthwhile hints and information for buyers of chemicals.

B100. Laucks Laboratories, 314 Maritime Bldg., Seattle, Wash. After quite a lapse this consulting company is again publishing bi-monthly Laucks' Notebook. First issue discusses "Does Research Pay? Can a Small Firm Afford It?"

B101. Krebs Pigment & Color Corp., Wilmington, Del. A "Handbook of White Pigments" is a convenient book of reference. Describes each of the company's white pigments briefly, indicating the field of use, consistency, physical and chemical characteristics and other pertinent information.

B102. Magnus, Mabee and Reynard, 32 Cliff st., N. Y. City. September-October catalog supplies price lists on essential oils, perfumes, colors, aromatic chemicals, etc.

B103. Mallinckrodt Chemical Works, St. Louis. October price list of chemicals for medicinal, photographic, analytical, and industrial uses.

B104. Merck & Co., Rahway N. J., October price list.

B105. Monsanto Chemical Co., St. Louis. *Monsanto Current Events* for September features the following articles: "Lacquers" by Dr. L. A. Pratt, director sales of Merrimac Chemical; and "The Origin of the Farm Chemurgic Movement," by Dr. William J. Hale, research consultant of Dow Chemical, an eminent competitor of Monsanto, thereby proving that competitors can be friendly enemies. Feature editorial is a stirring message on "Normal American Progress," by President Edgar M. Queeny.

B106. National Oil Products Co., Harrison, N. J. Although this new handbook discusses primarily the various Nopco products made for the silk and rayon industries, it contains many helpful and instructive suggestions for the general improvement in the finishing of silk and rayon fabrics. Embossing, de-sizing, scouring, boiling-off, dyeing and finishing are among the processes briefly considered—together with methods which have been found practical in remedying some principal fabric defects.

B107. The Porcelain Enamel & Mfg. Co., Baltimore, Md. Leaflet reveals a revolutionary method by which porcelain enamel frits are smelted continuously—a development that took 3 years to complete.

B108. Prior Chemical Corp., 420 Lexington ave., N. Y. City. Latest addition to the long list of house organs issued by chemical companies is the *Priorities* and the 1st issue discusses "Soda Ash, The Story of a Triumph and a Tragedy."

B109. Rolls Chemical Co., Ellicott Square Bldg., Buffalo. *Retorts* for October (house organ of this important jobber of industrial chemicals) comes in an entirely new and highly attractive layout and typographical dress. Consumers of chemicals within several hundred miles of Buffalo will find this monthly extremely interesting and instructive.

B110. Thiokol Corp., Yardville, N. J. Thiokol Facts reports on the very latest uses developed for this synthetic rubber.

B111. U. S. Gypsum Co., Chicago, Ill. A 47-page large-size booklet on lime in building, industry and agriculture. Really a short textbook on this most important raw material. Beautifully illustrated.

Equipment

B112. Aluminum Co. of America, Pittsburgh. "Finishes For Aluminum" is a 60-page illustrated booklet dealing with : Mechanical Finishes; Chemical Dip Finishes; Electrolytic Oxide Finishes; Electroplating On Aluminumclad Products; Paint, Lacquer and Enamel.

B113. The American Foundry Equipment Co., Mishawaka, Ind. Booklet No. 555 gives pertinent information on Featherweight (Dow-Metal) flasks, aluminum flasks, steel plate pouring jackets, flexible aluminum pouring jackets, and flexible cast iron pouring jackets.

B114. The American Foundry Equipment Co., Mishawaka, Ind. Data Book No. 22 is a 24-page discussion of American Dustube Dust Control apparatus and methods.

B115. The Barrett Co., 40 Rector st., N. Y. City. "Pipe Coating Specifications For Field Application," is an illustrated 82-page large-size brochure, issued to insure good practice in the application of Barrett protective coatings to underground pipe lines. Illustrations in the specifications help materially to a better understanding of the specified application methods.

B116. The Bristol Co., Waterbury, Conn. Bulletin No. 460T describes a new system of complete process control.

B117. The Brown Instrument Co., Philadelphia. A new catalog (No. 8901) covers the complete line of Brown air operated controllers. It explains in simple non-technical language the principle of operation and contains, as well, many helpful diagrams, illustrating their simplified construction, ease with which control units may be interchanged and ease of "tuning in" for "Throttling Range and Automatic Reset." Catalog No. 8901 also contains complete descriptions of Brown features: universal cases and their drilling dimensions; Brown Air-o-Motor valves; valve positioners; Air-o-Motor; and the Brown Power Cylinder.

B118. Carbondale Machine Corp., Harrison, N. J. Readers interested in absorption refrigeration will find this 16-page booklet (Bulletin 1104) of particular value. It explains the absorption method of refrigerating and gives detailed information on the Carbondale units. The 3 types of absorption machines—"Atmospheric," "Double-Pipe," and "Tubular"—are illustrated by line drawings showing every detail of construction. Photographs show various parts of the absorption system, including rectifiers, ammonia condensers, brine coolers, exchangers, absorbers, ammonia pumps, and compression machines.

B119. Chain Belt Co., 1600 W. Bruce st., Milwaukee. New booklet describes revolutionary screenings shredder, new in design, principle, and performance.

B120. Cochrane Corp., 17th and Allegheny ave., Philadelphia. Catalog No. 2534 illustrates the various models of Creasy Ice Breakers. These have several applications in the chemical field also.

B121. Edge Moor Iron Works, 30 Rockefeller Center, N. Y. City. New booklet lists the special equipment this company produces for the process industries fabricated from many types of metals and alloys. Profusely illustrated.

B122. Fairbanks, Morse Co. "Electric Machinery Catechism" is designed to answer those questions that are likely to arise in the minds of individuals who use electric equipment, and who do not have an extensive formal knowledge of electrical phenomona or terminology.

B123. Fairbanks, Morse Co., 900 S. Wabash ave., Chicago. Bulletin 555 describes Built-Together Pumps designed for general pumping service with capacities up to 900 g.p.m. and heads up to 260 ft.

B124. The Ideal Electric & Manufacturing Co., Mansfield, Ohio. A 4-page leaflet providing technical data on a new arc welder.

B125. Ingersoll-Rand Co., Cameron Pump Division, Phillipsburg, N. J. Bulletin No. 7066 covers the line of Coupled Pumps, of capacities from 150 to 5,000 g.p.m. against heads between 20 and 250 ft. Particularly adaptable for water, gasoline, brine, ammonia, starch, naphtha, alcohol, benzine, soap liquids, dyes, cutting compounds, chemicals, tanning extracts, acid mine water, and a wide variety of liquid chemicals.

B126. Johns-Manville Corp., 22 E. 40th st., N. Y. City. A 28-page booklet entitled "Things You Should Know About Your Roof" will prove invaluable to maintenance engineers in the chemical and allied fields.

B127. Givaudan-Delawanna, Inc. September *Givaudanian* discusses the Patman Law, control of the price of bergamot oil by Italy, and chemical and physical properties of Rhodinol and Citronellol, 2 well-known perfume raw materials.

B128. Givaudan-Delawanna, Inc., 80 5th ave., N. Y. City. September Industrial Aromatics Division of the *Givaudanian* discusses "Halitosis Is Frowned Upon Even In Textile Finishing Oils." Also reports on new rubber deodorants developed by the company.

B129. Leeds & Northrup Co., 4901 Stenton ave., Philadelphia. Bulletin 709-C discusses new equipment which automatically regulates the addition of milk-of-lime to raw can juice so as to hold it as the pH management specifies.

B130. Lewis-Shepard Co., 175 Walnut st., Watertown, Mass. Folder No. 225 is perhaps the most complete showing of floor trucks for factory, warehouse, and industrial use ever included in one booklet.

B131. The Linde Air Products Co., 30 E. 42nd st., N. Y. City. Those charged with welding problems in chemical or chemical process plants will find the monthly *Oxy-Acetylene Tips* of great value.

B132. Link-Belt Co., 2810 W. 18th st., Chicago. *Link-Belt News* is a monthly publication that every chemical plant executive should receive regularly. October contains the announcement of the production now in the U. S. of Rotary Louvre dryers.

B133. Link-Belt Co., 2410 W. 18th st., Chicago. No. 1619 is a new 28-page book which describes automatic coal stokers for industrial and commercial use in capacities up to 300 H.P.

B134. Littleford Bros., Cincinnati. This well-known company in the plate and sheet steel fabricating industry presents the story of Littleford service to the chemical and process industries and provides the reader with a wide variety of photographs of recent installations.

B135. Mines Safety Appliances Co., Braddock, Meade and Thomas sts., Pittsburgh. A bulletin, describing their new Improved M. S. A. Methane Detector has just been issued.

B136. The N. J. Zinc Co., 160 Front st., N. Y. City. Volume 4, Number 4 of *The Alloy Pot* contains a discussion of the finishing of Zinc Alloy Die Castings, a brief résumé of a paper of Chief Chemist J. C. Fox, Doehler Die Casting Co., read before the American Society for Testing Materials and published in the July issue of *Abrasive and Cleaning Methods.*

B137. The Patterson Foundry & Machine Co., East Liverpool, Ohio. Four-page leaflet describes the Patterson Unipower Agitator, reported in the June New Equipment Section of C. I.

B138. Pyrene Manufacturing Co., Newark, N. J. New leaflet describes a revolutionary method of foam fire fighting that is of special value in plants where flammable chemicals are processed or stored.

B139. John Robertson Co., 121 Water st., Brooklyn. *Robertson Reminders* for October shows several installations of Robertson pumps and presses.

B140. Semet-Solvay Engineering Corp., 40 Rector st., N. Y. City. A new booklet describes the R S De-Emulsifier employed in the disposition of tar emulsions formed in the manufacture of water gas. Detailed plant layouts are shown. General instructions for operations are provided.

B141. F. J. Stokes Machine Co., 1520 Locust st., Philadelphia. Volume 11, No. 2 of *Process News* is mostly devoted to pictures of equipment recently built for the chemical, process, and pharmaceutical fields. C. I. readers can receive this regularly by requesting through the New Booklets Dept.

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets; specify by number: ....

....

Name ....
Title ....
Company ....
Address ....

All information requested above *must* be given to receive attention.

Modern Fumigation in Europe

By Dr. W. Heerdt*

THE United States is a paradise for insects as compared with Europe. Reproduction due to the moist and warm summer climate in the greater part of this country is faster; species and life cycles are more numerous. Therefore, with the universal accumulation of production in certain centers and the growth of the units of production and stocks, with the concentration of the population in large well-heated dwellings, the pests in this country are troublesome to a greater degree.

Nevertheless, "extermination" has always been a profession with us too and the story of the rat-catcher of Hameln originated in my country. This profession, as it probably did here too, included the fumigation with sulfur dioxide, preferably used for bedbugs. In Germany we call it "schwefeln", meaning "sulfurize". And overcrowded as our cities were in the middle ages, I believe there was a lot of work to do.

This overcrowding—of course, not quite in the unsanitary conditions of the past—still exists. In England one-quarter of the number of the American population is living on an area the size of the State of New York, and the whole of the German population, which is one-half of the American, is living on an area of only four of your normal sized Eastern states. In spite of this obvious overcrowding, the modern way of fumigation, for instance, with hydrocyanic acid, has been taken up in Europe only about 20 years later than over here. This fact is proof of the comparatively little need of pest control on the other side.

As to the nature of individuals engaged in the profession of fumigation (that is to say, with highly poisonous gases), there is a decidedly different development in some European countries. The "exterminators," inasmuch as they do not fumigate, are the old type of men.

Germany is one of the outstanding examples of a new development in that none of the established exterminating firms have ever started fumigating work there. It was the Government during the war, that is to say, in a time of scarcity and bad repair, at the inspiration of the chemical industry and with Dr. Haber in charge of the respective Government department, who started fumigation work in flour mills and military barracks. A special subdivision was organized, of which I was made the manager.

At the end of the war this young organization was handed over to a commercial firm, founded for this purpose, namely: Deutsche Gesellschaft fuer Schaedlingsbekaempfung, controlled by the producers of fumigating chemicals, and with which I am still connected.

Not long before that time there occurred what very frequently, as you know, is the first move of our Government—the issue of a regulation, in fact, a national law regulating the use of poisonous gases, especially hydrocyanic acid gas. This was in the year 1919. Under this law only licensed firms were allowed to do fumigations. The new firm, together with a slowly increasing number of others, then secured concessions.

Soon afterwards firms managed by chemists or engineers were founded in Austria, Hungary, Jugoslavia and England. With these firms we came in contact shortly thereafter, and they now form, together with a number of firms in other countries, a part of our organization as our customers or agents and as our technical friends.

In other countries of the Continent, development went about the way it did here: the more enterprising exterminator would take up fumigation with more or less luck, knowledge, energy and patience. But laws, regulations or city ordinances were afterwards put in force in almost all of the European countries. Even in England, a country which generally is reluctant to encroach upon civil life, a law has now passed the House of Commons and will most probably be in force next year.

Whatever you may think in general about Governments regulating the activities of their citizens, in the field of fumigation with highly poisonous gases, there can be no doubt as to its necessity. We in fact even thought it to be so conducive to the good of our industry that we not only co-operated with the Governments in the matter, but quite often suggested measures which we thought to be beneficial. What is good for the public in the long run must be so for the industry. Certainly the development would have been different, had we not had reasonable Governmental restrictions by law and the co-operation of the producers of fumigants.

We have never done any fumigation without some sort of a breathing protection. The reason therefore was not supervision by authorities, but simply because chemists were in charge of the first practical work, chemists with laboratory and war-gas experience. When we first started work, we were protected by oxygen breathing apparatus of the type used in rescue work in mines. We soon found it to be too cumbersome, too heavy, dangerous in narrow spaces because of the possibility of the hose being caught, the movement of the head being hindered, and besides, quite expensive. We turned to the gas-mask as used in the army, and had special filters made. The masks were and are still made of leather, preferably, or of rubber-lined canvas, never of rubber alone, which we think is quite unsuitable on account of the heat developed under it, and the sound insulation qualities of the material.

We have no exhaling valve because of the better absorption or what it really is, reaction of the gas with the neutralizing compound through the moisture and warmth contained in the exhaled air and because of the rinsing effect of the exhaled air on the filter filling. We have transparent disks fixed inside on the goggles, absorbing all moisture and insuring clear view at all times. The filter which is screwed directly on the facepiece is small and light, though giving full protection even in high concentrations and buildings of any practical size, say, up to 3 million cu. ft. Nothing could be simpler and more comfortable.

This is in accordance with our principle to simplify everything in connection with fumigation, not only with a view to safety but also to efficiency and ease of application. I want to emphasize that there has not been one accident in our German organization due to the gas-mask with work done of over 4 billion cu. ft. since 1917.

This does not mean that we had no casualties at all. In fact, we had some 20 fatal accidents in Germany. About 90 per cent. due to carelessness at a time when we had to employ soldiers, with the selection of whom, as to their suitability for this type of work, we had no influence. Since 1923 there were no further accidents, resulting in reduced insurance premiums.

What are the pests we have to control by fumigation? In the order of rodents, there is practically only the rat, more especially *epimys rattus*. The mouse is of minor importance. Mice in agriculture are not of our concern. This field is taken care of by the farmers and their organizations. Insects of the first line, in the approximate order of their frequency are:

Cimex lectularius	Bedbug
Ephestia kuehniella	Mediterranean Flour Moth
Blatta germanica	Cockroach
Calandra granaria	Granary Weevil
Hylotrupes bayulus	A Wood Borer
Anobium striatum	Death Watch Beetle

* Dr. W. Heerdt represents the Deutsche Gesellschaft fuer Schaedlingsbekampfung m.b.h., Frankfort (Main), Germany. Address was delivered before the Convention of the National Association of Exterminators and Fumigators held in Cleveland, Ohio, Oct. 26, 27, 28, 1936.

Then varying in frequency but all of minor importance, there are:

Ephestia elutella	Tobacco Moth
Tribolium navale	?
Gnathocerus cornutus	Broad-horned Flour Beetle
Laemophloeus ferrugineus	Probably Red Flour Beetle
Oryzaephilus surinamensis	Saw-toothed Beetle
Bruchus pisorum	Pea Beetle
Laria lentis	Lentil Beetle
Dermestes lardarius	Larder Beetle
Lasioderma serricorne	Tobacco Beetle
Tinea granella	Grain Moth
Plodia interpunctella	Indian Meal Moth
Tinea cloacella	Cork Moth
Aleurobius farinae	Mite
Tenebrio molitor	Yellow Mealworm
Niptus hololeucus	Brass Colored Beetle
Tineola bisselliella	Clothes Moth
Lyctus linearis	European Lyctus (Powder Post Beetle)
Anthrenus scoophulariae	Buffalo Carpet Beetle
Chrysomphalus dictiospermi	Red Scale
Aspidiodus hederae	White Scale
Tepidosaphes pinniformis	Purple Scale
Parlatorea zizyphi	?

Scales without shield:

Icerya purchasi	Cotton Cushion Scale
Pseudococcus citri	Common Mealy Bug
Lecanium hesperidum	Soft Brown Scale
Lecanium oleae	Olive Scale

The premises in which fumigations are carried out are principally food factories, ships, warehouses, silos (elevators), dwelling houses, public buildings, barracks, hospitals, hotels, textile factories, abattoirs, museums, churches and others. The size of the premises to form a job varies from the single room fumigated against bedbugs of some 1000—1500 cu. ft. to the biggest single building which has ever been fumigated of approximately 8.5 million cu. ft., about the cubic content of the Capitol in Washington. I have no exact figure of the fumigation vaults existing in Europe, neither of the commercial vaults nor of the government and private vaults. In Germany there may be some 50 atmospheric pressure chambers. Vacuum fumigation is not done to any extent; perhaps three or four exist in Europe.

The modern chemical compounds used for the major fumigations, speaking of general fumigations are: hydrocyanic acid and ethylene oxide; for minor work, methyl formate, chloropicrin and nicotine. Sulfur dioxide belongs to a group of its own and will not be considered at this time.

The forms in which these chemicals are used are as follows: by far the preferred form for HCN is the absorbed form in cans known under the trade name of Zyklon, i.e. either granular or discoids (to give you a figure: Sweden with an approximate population of the state of Ohio, took 100,000 lbs. of HCN in Zyklon last year). In a few European states liquid HCN is used: England, France, Spain, Italy. Calcium cyanide is used for general fumigation, but preferably for greenhouses. The pot method has disappeared almost entirely.

Ethylene oxide with the trade names of T-Gas and Etox is used with an addition of carbon dioxide, shipped in steel cylinders of varying sizes, and used preferably for bedbug work in single rooms and flats. Methyl formate, chloropicrin and nicotine are sold as such or under trade names like Areginal for methyl formate.

Contrary to the custom of this country, hardly any concern in need of fumigation would do the work itself, except in fumigation vaults, and in some cases even this is done by the personnel of a fumigating firm. Also it is an exception if authorities meddle with practical fumigation work, as, for instance, the Municipal Sanitation Department of the City of Rotterdam, doing ship and general fumigation work of every description and very efficiently indeed.

Why is that so? I believe the only answer is that comparatively early there were in Europe highly specialized well trained fumigation firms who really took the lead in fumigation activities right away.

There are some figures which I should like to give you because they will be real information for you, as they pertain to the well controlled work done in Germany. There have been fumigated:

In 17 years ending 1934—1,398 flour mills with approx.	688	million cu. ft.
In 17 years ending 1934—Miscellaneous premises "	619	" " "
In 12 years ending 1934—5,572 ships "	2,598	" " "

This work was carried out through the German fumigating firms, of which really two do the bulk of it; all the big jobs at any rate. The latter firms' fully licensed technical staff is about twenty-five, all fully paid the year round. The gas used was almost all HCN, since 1926 exclusively in the form of Zyklon B or Zyklon Discoids.

What is the technical practice of our fumigation work? The conditions *sine qua non* for a fumigation are mainly about the same as adopted voluntarily by the careful fumigators in this country with a few additions: Advance information of the authorities concerned and of possible neighbors; careful preparations including sealing of the premises; providing a sufficient number of fumigators and watchmen, certain types of buildings requiring special precautions; a minimum period of ventilation of 20 hours followed by a chemical test. Only after a negative test the premises can be released to the owner.

These are in broad lines the German official orders—they are supplemented voluntarily by prescriptions of the individual firms, ours for instance spreading over 74 printed pages. There is not much difference between the German regulations and those of other countries. Particularly do most of them ask for a chemical test, really for the copper benzidine acetate test, on which we have practically relied for almost 20 years. For a limited number of insects we give a formal guarantee for the kill; expiring, however, the moment our fumigators leave the building.

For the fumigation of citrus trees, I am not quite competent. But to round up the field I may say that in the two European countries where tree fumigation is going on, namely: Spain and Italy, quite a bit of the work is still done by the time-honored pot method; the modern methods like liquid and calcium cyanides, making headway slowly. The work is carried out either by commercial fumigators or by co-operative societies and is supervised by state authorities.

This I think covers the routine of fumigation with us. What does it really mean in the light of pest control? Can a man living as we do in the age of hygiene, of quarantine, of asepsis, in short of prevention against the omnipresent bacteriae, of sewage, of the individual towel and so on, of the many comforts afforded us, even down to the newest comfort (perhaps soon more than a comfort)—the conditioning of air—can a man in consideration of all that be satisfied with that state of development? He certainly can not! What we still are doing, perhaps in a little more refined manner than formerly, is just killing a few bugs or moths here and there. Is that pest control—not to speak of "extermination"? Is it not in principle staggering that we should use good materials and practice these insufficient old methods which lead nowhere? I certainly think it is! And now here we are on a common platform: the fumigators, the exterminators, the zoologists, the entomologists, the medical officers and the governments of the world!

Let me pick out one problem—the problem of the bedbug. The majority of the world's population, including the so-called civilized population, is forced to live together with the bedbug the major time of their lives. Still it is a fact that for many years past we have known enough about this insect's habits to be able to locate it, and another fact is that we know how to kill it—the whole family! Why then is this pest not better controlled? It is very well sheltered behind the feeling of shame (whereas, in fact, there is with enough information really nothing to be ashamed of), and behind the general attitude of

the public health departments of the world, the bedbug is a matter of a mere private concern. Another fact not to be forgotten in that connection is that about one-quarter of all men do not perceive the bedbug at all, because they are insensible to the sting and its consequences. To tell the folks the truth about all that is an essential part of our business.

Now comes real news, perhaps not entirely new to some American exterminators but certainly epoch-making. Two of the European governments, in fact, governmental administrations, namely: the English and the Swedish, have become active against the bedbug. In England some time ago—very wisely—one of the major steps was publicity, publicity of the noblest kind. One of the most honorable Lords in the House of Lords got up and told the sad story of the bedbug in England. Next day the *Times* printed an editorial—indeed not on the bedbug—but on *cimex lectularius*. So a campaign was started. There was already a law which backed the action, and on such legal basis, the municipal corporations went ahead. Since December 1932, with Manchester being credited as the first of many other English communities, tens of thousands of families every year began a new life without bedbugs, either because their furniture was fumigated right in the moving van or because their homes were fumigated from the cellar to the attic. This is done free of cost if they move into corporation-owned houses. Even the houses from which they move are fumigated, even if demolished, to prevent dissemination of the bug, through the old timber sold to be built in again or as firewood. A similar practice has been in force in a few of the Austrian cities for over ten years, but on a much smaller scale due to the lack of funds. In Germany some big organizations have turned to a more methodical way of extermination in dealing with the housing of great masses of men.

Sweden is the cleanest country on earth, not only on account of the personal cleanliness of the people, which alone is insufficient as a measure against bedbugs, but perhaps even more for their concern for efficiency even in the most minute detail. This quality drives them to cut in where dirt is first created and also to keep their houses in good repair. They demonstrated the theory that where the bedbug once is established and no sweeping fumigation of the entire building, or rather of a block of buildings is done, and no concerted measures are taken, the people's individual fight against this insect results in failure.

The first step was to get figures on infestation. The best inquiry of the kind I know of was made in the city of Malmoe, a town of somewhat below 100,000 inhabitants. It is characteristic of the people's minds that 94 per cent. of the 6,704 questionnaires were at once filled in, and the rest on special request, so that a 100 per cent. report was at the disposal of the authorities. In the crowded part of the city 52 per cent. of the houses were infested; the average for the whole city was 28 per cent.

I quote at random from my records concerning Sweden. A Swedish law issued in 1930 says: "If necessary, and the circumstances do not call for other measures, the Health Dept. is entitled to order the extermination of vermin in dwelling-rooms and connecting rooms, as well as in clothes and furniture." Malmoe is considering the building of a kind of hostel for people who have to evacuate their homes because of the fumigation thereof. In Stockholm in 1932, in one house 32 fumigations were carried out, in another house, 22; in 2 houses, 13; in 337 houses, 3-4. In Ystad only inspected and eventually fumigated furniture is allowed to be sold at auction.

The city health department of Stockholm, in conjunction with the associations of owners and tenants of houses, are running advertisements in daily newspapers asking everybody to help in the campaign against bedbugs. In 1932 the loss through fire in Stockholm was Kr. 855,000 whereas it has been estimated that the cost of fumigation and extermination was over Kr. 1,000,000 for the same period. The health department at Malmoe had to compel 89 house owners or tenants to take measure against bedbugs. In Stockholm a house with 30 beds has been provided for dislodged tenants while their homes are being fumigated.

Statistics in Stockholm gave evidence that 47 per cent. of the parties moving did so with bedbug infested furniture. With 20,000-30,000 parties moving on October 1st of each year, this means that 9,000-14,000 parties are moving with bedbugs. In Stockholm about 200 sales by auction per year are held in private homes. In the month of July of this year the Swedish Parliament has asked the Government to take action with a view to methodical measures against the bedbug.

It is good news, but only a start—and therefore I urge "Don't tolerate—exterminate!"

Waterproofing Studies at Mellon

Test methods employed by the Textile Finishing Fellowship at Mellon Institute of Industrial Research, Pittsburgh, Pa., in the development of improved waterproofing preparations for open fabrics, are described in a publication that is being distributed gratis to interested companies and specialists.

In the theoretical discussion, the distinction between water repellency and waterproofness is emphasized. Water repellency is resistance to wetting, a surface property. Waterproofness is resistance to penetration by water, and, in open fabrics, depends not only on the water repellency of the thread surfaces, but also upon other physical properties of the cloth, particularly the size of the largest openings through it. The measure of water repellency is the effective adhesion tension of the repellent surface, which is revealed by the magnitude of its equilibrium contact angle. The characteristics of contact angles are discussed. Water repellency varies with surface roughness, which is very high for fibrous surfaces, and modifications of the theoretical equations for wetting action required to adapt them to rough surfaces are considered. The tilting-plate principle is employed in a convenient and dependable experimental method for measuring and comparing contact angles of water against different solids. Effective adhesion tensions for various waxes, gums, metallic soaps and other compounds are reported. For the measurement of waterproofness in light-weight open fabrics, a hydrostatic pressure method is used. The apparatus is that of Barr. The pressure head is increased at the rate of 1.5 to 2.5 cm. per min. and premature leakage at the clamped edge of the test piece is prevented by the use of rings of adhesive tape. The method of recording and analyzing the test data to arrive at a numerical rating for the waterproofness of the fabric is explained in detail.

Production Wetting Agents

Products having detergent, emulsifying, softening, and wetting properties are prepared by heating glycerides of fatty acids or the fatty acids themselves to a temperature of 45° C. or above with sulfonating agents containing glycerinetrisulfuric acid. Diluents such as trichlorethylene, carbon tetrachloride and glacial acetic acid may be used. Products are suitable for emulsifying fats, oils, paraffins and waxes, and may be used in the textile and leather industries. In examples, sulfonating agents prepared from glycerine, oleum and monohydrate are heated with olive oil, cocofat, cocofat acids, castor oil and naphthenic acids, and the products mixed with ice and neutralized to form oils, pastes, or powders. Palm oil and fish oil are mentioned as starting materials. English Patent No. 450,368, assigned to Chemical Works, formerly Sandoz, Basle, and digested by British *Chemical Trade Journal.*

Interpreting the Federal

Caustic Poison Act

By J. G. Shibley

U. S. Food and Drug Administration

IN 1924, through the efforts of the American Medical Association and others, bills for the regulation of the labeling of certain caustic or corrosive substances were introduced in a number of State legislatures. During the period 1924 to 1927, sixteen states passed laws on the subject. Coincident with the efforts for State legislation, a bill was introduced under the same auspices in the Congress of the United States in 1924 and was followed by other bills until, on March 4, 1927, the Federal Caustic Poison Act was passed.

The following extracts from reports of committees of the Senate and the House of Representatives outline the reasons which motivated Congress in enacting the legislation:

> (Senate Committee) "The purpose of this legislation is to protect the public from such dire disasters as have resulted through ignorance or lack of information regarding the poisonous effects of lye and similar caustic substances used in the homes for floor polishing, cleansing, and opening of drains. . . .
>
> "The committee was impressed by the evidence brought out at the hearing, showing the danger to child life in the homes of the people of packages containing caustic and corrosive substances. The committee was informed of the increasing number of deaths and fatal constrictions of the oesophagus (gullet) due to the drinking of lye and similar substances by children. Lye in quantities of less than 30 grains has been fatal to children. . . .
>
> "Lye is sold in every grocery store. Lye goes into all our kitchens. Lye is swallowed by children, with serious, often fatal, results. Obviously lye should be labeled 'poison.' The American medical profession, as a unit, is for the enactment into law of Senate bill 2320. The profession of medicine is for this enactment into law purely for humanitarian reasons. . . ."
>
> (House Committee) "The particular danger originally sought to be obviated by the measure was that resulting from the household use of sodium hydroxide, or concentrated lye, which goes into the home in many forms of cleansing preparations and laundry powders. It seemed wise, however, to make the measure comprehensive in scope and to include within its provisions such other substances as are in common household use, or such as might reasonably be expected to constitute a source of danger as the result of use in the household. . . ."

The enforcement of the law was assigned to the Department of Agriculture. The Food and Drug Administration of that Department was designated the administering agency.

The purpose of this article is to outline concisely the provisions of the Federal Caustic Poison Act and explain the several labeling requirements in a manner which it is hoped will be helpful to manufacturers and printers in devising labels in full compliance with the law.

The rules and regulations for the enforcement of the act have been published in a pamphlet identified as Service and Regulatory Announcements, Caustic Poison No. 1, which is furnished without charge by the Food and Drug Administration.

The act applies to the following substances and preparations containing them in a concentration of the percentages (by weight) noted:

1.	Hydrochloric acid (HCl)	10% or more
2.	Sulfuric acid (H_2SO_4)	10% " "
3.	Nitric acid (HNO_3)	5% " "
4.	Carbolic acid (C_6H_5OH)	5% " "
5.	Oxalic acid ($H_2C_2O_4$)	10% or more
6.	Any salt of oxalic acid	10% " "
7.	Acetic acid ($HC_2H_3O_2$)	20% " "
8.	Hypochlorous acid or its salts (except chlorinated lime) to yield available chlorine	10% " "
9.	Potassium hydroxide (KOH)	10% " "
10.	Sodium hydroxide (NaOH)	10% " "
11.	Silver nitrate ($AgNO_3$)	5% " "
12.	Ammonia water (NH_3)	5% " "

These products are subject to the law when shipped, or delivered for shipment, in interstate or foreign commerce, or received from shipment in such commerce for sale or exchange, or sold, or offered for sale, or held for sale or exchange, in any territory or possession of the United States or in the District of Columbia, or offered for importation into the United States.

The law provides that labels shall bear the word "poison," the common name of the caustic or corrosive substance, directions for treatment in case of accidental injury, and the name and place of business of the manufacturer, packer, seller, or distributor. These markings are not required unless the caustic or corrosive substances named in the act, or preparations containing them, are in retail parcels, packages, or containers "suitable for household use." The inclination of the trade is to construe the expression "suitable for household use" as meaning use in the home. Protection of the home is, of course, the primary purpose of the law, but that Congress did not have in mind the limitation of the act to products for use in the household is indicated by the exception in Section 2 (b) (4). This section requires that containers shall bear directions for treatment in case of accidental personal injury, but provides that such directions "need not appear on labels or stickers on parcels, packages, or containers at the time of shipment or of delivery for shipment by manufacturers and wholesalers, for other than household use."

The law is silent in respect to the size of containers to be classed as "suitable for household use." Regulation 1 defines the expression to mean and imply adaptability for ready and convenient handling in places where people dwell. As a matter of administrative procedure, the Department, as a general rule, has been applying the act to substances of 1 gallon or less for liquids and 10 pounds or less for dry materials. There have been a number of exceptions, as, for example, caustic soda in 25, 50 and 100-pound drums sold for use in chemical toilets around the farm, and large drums of disinfectants containing 5% or more of phenol and bearing labeling recommendations of a type indicating their use in places where people dwell.

The following explanatory comments will assist the trade in the preparation of legal labeling:

(a) *The word "poison."* The letters for the word *must* be uncondensed Gothic capitals. A Gothic capital letter is a square-cut type of letter with no serifs—cross lines at the top or bottom. The following type illustrates uncondensed Gothic capital letters of 24-point size:

POISON

POISON

POISON

The first step in determining the size of letters to use in stating the word "poison" is to inspect the other reading matter appearing elsewhere on the label. If a letter of 24-point size or larger is found, the word "poison" must be stated in letters having a face height of at least 24 points (one-third of an inch),

as shown before. If the largest letter on the label is less than 24-point size, the letters for the word "poison" must be not smaller than the largest letter. In designing the label the word "poison" must be placed parallel with the main body of reading matter on the label. The law specifies no particular color for the word, but requires that it appear on a clear, plain background of a distinctly contrasting color.

Deviations from the mandatory requirements of the law in respect to the size and style of letters for the word "poison" have been far more common than failures to employ the other markings specified by the statute. The law permits no exceptions to these requirements.

(b) *Antidotes.* Containers *must* bear directions for treatment in case of accidental personal injury unless they are within the exception stated in Section 2 (b) (4). The antidotes for the particular substance being labeled should appear, preferably, immediately following the word "poison." All of the substances covered by the law require antidotes for treatments in case of both internal and external injury, and some of them, an additional one in the event of injury to the eyes. The type used in printing the antidotes must be of such size and style as to be easily legible.

For the guidance of the trade and in the interest of uniformity of treatment, the Department, early in the enforcement of the Caustic Poison Act, issued a pamphlet (Service and Regulatory Announcements, Caustic Poison No. 2) containing acceptable antidotal treatments. These antidotes have received the approval of competent medical authority and, for the most part, name substances readily available in the home. Their primary purpose is to provide immediate treatment for the injured person until the arrival of a physician who is in position to administer more thorough treatment, if necessary.

(c) *Common name of the substance.* The substances mentioned in the act are common names. If the product being labeled is any one of these and the name of the substance appears on the label, the requirement of the law in so far as stating the common name is concerned will be fulfilled, provided, in the language of the act, "a conspicuous, easily legible label" is employed. If a preparation is marketed under a trade or fanciful name and it contains any of the substances covered by the law, the name of the particular substance, in addition to the fanciful name, must be stated. For example, there are a number of drain-pipe cleaners composed for the most part of sodium hydroxide but marketed under various fanciful names. The labels for these products, preferably either immediately after the fanciful name or the word "poison" must state in easily legible type, "Contains Sodium Hydroxide," or "Contains Caustic Soda."

(d) *The name and place of business of the manufacturer, packer, seller, or distributor.* If the name on the label or sticker is other than that of the manufacturer, it shall be qualified by such words as "Packed for," "Packed by," or "Distributed by," as the case may be, or by other appropriate expression. Again, attention is drawn to the fact that the statute requires the statement to be "easily legible."

A partial listing of products that may include one or more of the substances covered by the act, thus becoming subject to the law if shipped within its jurisdiction in parcels, packages, or containers suitable for household use, may be of interest to manufacturers.

Hydrochloric acid: Builder's acid (for cleaning bricks), tinner's acid (for making soldering fluid), metal cleaners, sink and bowl cleaners, scale solvents, and weed killers.

Sulfuric acid: Fluid for fire extinguishers, electrolyte for lead-storage batteries, electrolyte for electrolytic rectifiers, metal cleaners, and toilet-bowl cleaners (acid sodium sulfate).

Nitric acid: Metal cleaners, acids for etching metals and lithographic stones, mole and wart eradicators.

Carbolic acid: Phenol liquefied, 5% solution of phenol, carbolic disinfectant soaps, coal-tar disinfectants, carbolated vaseline and oils, toothache remedies, and other dental preparations.

Oxalic acid and its salts: Metal and wood polishes, straw-hat cleaners, photographic chemicals—blue-print and platinotype processes, ink removers, rust removers, bleaching preparations, and soluble laundry blue.

Acetic acid: Ink eradicators, photographic hardeners, sours for laundry bleaching, shoe polishes, metal polishes, wart removers, and glacial acetic acid.

Hypochlorous acid: Calcium hypochlorite.

Potassium and sodium hydroxide: Potash or lye for making soaps, paint and varnish removers, washing and cleaning preparations, dehorning preparations, boiler compounds, drain-pipe cleaners, electrolyte for Edison storage batteries, caustic soda or potash for use in radio, A-eliminators employing electrolytic condensers, manicuring preparations, and beer-pipe cleaners.

Silver nitrate (lunar caustic): Wart removers, hair dyes, silver-polishing and plating compounds, intensifiers for photographic work, and indelible marking inks.

Ammonia: Water ammonia, U. S. P., stronger water ammonia, U. S. P., household ammonia, cleaning compounds, liniments, and permanent wave solutions.

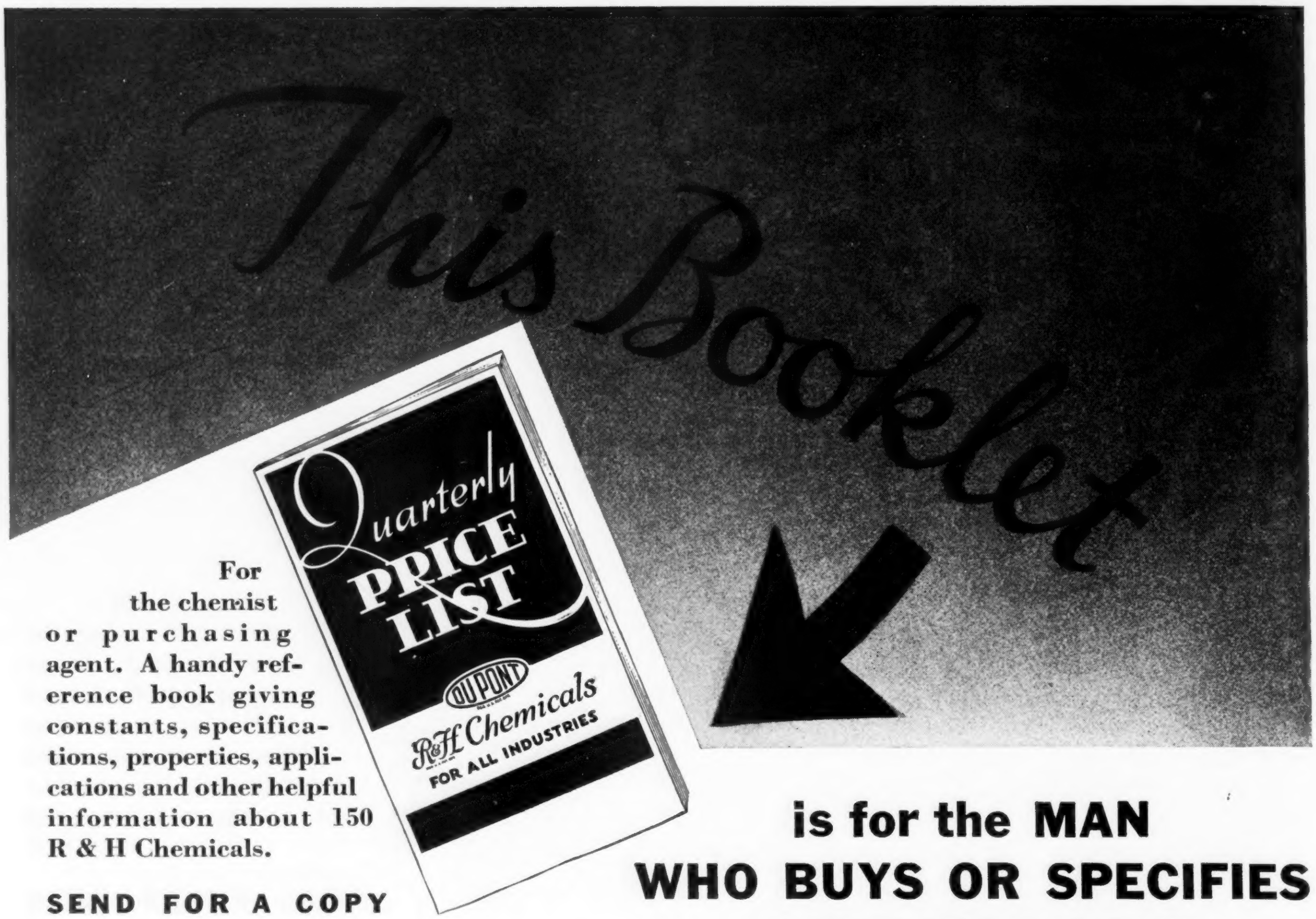
Various substances: Toy chemistry sets.

The Food and Drug Administration, in its enforcement operations, has observed a general disposition on the part of the trade to meet the statutory requirements. Labeling discrepancies are not encountered as frequently now as during the earlier enforcement of the law, especially in respect to the labeling of lye and containers of the other caustic or corrosive substances specifically named by the law. Notices of court judgments published to date and cases now pending in court, for the most part, concern compounds containing one or more of the caustic or corrosive substances, such as drain and pipe cleaners (sodium hydroxide), bowl and cleaning preparations (hydrochloric acid), liniments (ammonia), disinfectants (carbolic acid), mole treatments (nitric acid), hair-waving solutions (ammonia), beer-pipe cleaning compounds (sodium hydroxide), chemistry outfits (various poisons), caustic pencils (silver nitrate), battery charges (sulfuric acid), scale solvents (hydrochloric acid), and hat cleaners (oxalic acid).

Arsenical Fungicides and Insecticides

A patent has been taken by Boliden for the use of arsenic compounds for the protection of plants and trees against fungi and insects. According to the patent description, there is always danger in using arsenates and arsenites for spraying that these substances may contain acid components, or that by interaction of the atmosphere such acid substances may be formed, which, under certain circumstances, will hurt the green parts of the plants and trees. Object of the invention is to eliminate this risk by the use of such difficultly soluble inorganic salts which contain arsenic, together with another metal and ammonia. The ammonia is bound to one or more of the arsenic atoms, and eventually, with secondary valencies, to the metal atoms, in such a way that the salt acquires an alkaline character, and consequently acid compounds originally present or gradually liberated are directly neutralized.

In certain cases it may be advantageous to use a salt having such a high content of ammonia that it is liberated after the spraying, and by its odor drives away injurious insects. Salts of zinc and copper are particularly suitable. They can be produced by mixing a metal salt, if desired in the presence of ammonium salts, with suitable amounts of ammonia and arsenic salt, after which a complex metal-ammonium arsenic salt of the desired composition is obtained by evaporation of the excess of ammonia, eventually at increased temperature.—C. A. Robak, *Industrial and Engineering Chemistry* (News Edition).



For the chemist or purchasing agent. A handy reference book giving constants, specifications, properties, applications and other helpful information about 150 R & H Chemicals.

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is for the MAN WHO BUYS OR SPECIFIES CHEMICALS

Here's Some of the Timely Information

NON-FLAMMABLE SOLVENTS . . . *for dry-cleaning, metal degreasing, extraction of oils, and many other uses.*
Methylene Chloride, Chloroform, Carbon Tetrachloride, Dichlorethylene, Trichlorethylene, TRI-CLENE*, Perchlorethylene, Tetrachlorethane, Pentachlorethane, Beta-Trichlorethane.

CYANIDES . . . *for steel treating, electroplating, metal cleaning, fumigation, organic synthesis.*
CYANEGG* (Sodium Cyanide, 96–98%), Cyanide-Chloride Mixture, 75%, Cyanide-Chloride Mixture, 45%, Case Hardener, Sodium Cyanide, 30%.

PEROXIDES . . . *for bleaching, pharmaceutical and cosmetic preparations, general oxidation purposes.*
ALBONE* C (Hydrogen Peroxide, 100 Vol. Electrolytic), SOLOZONE* (Sodium Peroxide), Sodium Perborate, Calcium Peroxide, Magnesium Peroxide, Strontium Peroxide, Zinc Peroxide, Zinc Perborate.

REFRIGERANTS . . . *for domestic and commercial refrigeration units.*
ARTIC* (Methyl Chloride).

*Reg. U. S. Pat. Off.

SODIUM, 99.9% . . . *reactive chemical for industrial and laboratory work.*

P. A. C.* FORMALDEHYDE (*Solution U. S. P.*) . . . *for disinfecting; plastic manufacture; embalming fluid, treating paper, leather, textiles; chemical synthesis.*

PLATING PROCESSES . . . *for decorative and protective coatings on metal parts.*
DUOZINC* (Zinc-Mercury), Electrotinning (Sodium Stannate-Acetate), Gold and Silver Cyanides, Copper Cyanide, Zinc Cyanide.

CERAMIC DECORATIONS . . . *for decorating glass, china, tile, terra-cotta, porcelain.*
Gold and Metallic Decorations, Liquid Lustre Colors, Glazes, Stains, Oxides and Fluxes.

CERAMIC MANUFACTURE . . . *for making glass, pottery, enamels.*
"Chemi-Trold"* Feldspars, Chemicals and Oxides.

MISCELLANEOUS CHEMICALS . . . *for Plating, Refrigeration, Plastics, Ceramics, Extermination, Rubber, Textile, Leather, Paper, Pharmaceutical and Process Industries.*

DU PONT
REG. U. S. PAT. OFF.

The R. & H. Chemicals Department
E. I. DU PONT DE NEMOURS & COMPANY, INC.
Wilmington, Delaware
District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

Industrial Specialties

Industrial Colloids & Chemicals Enlarges Plant

For the past 2 months the Industrial Colloids & Chemicals, Inc., Knoxville, Tenn., has been reconditioning its plant, and have just completed the installation of machinery. This includes some of the latest type of equipment for the processing of specialty chemicals, such as new ester products, including the aryl and aliphatic (fatty) alcohols, new condensation products, new polymerization products and the like. This company will give its 1st attention to the textile trade.

Company has a Tennessee charter, with capital stock of $25,000. Robert Cowan, executive vice-president, in charge of plant operation is a chemist of wide experience, particularly in the production of textile products such as detergents, penetrants, sulfonates, softeners, sizings, and finishers, and other specialties. G. M. Gillis, secretary and treasurer, was formerly vice-president in charge of sales of the Fulton Sylphon Co., Knoxville.

Onyx Enters Leather Chemical Specialty Field

Onyx Oil and Chemical, Jersey City, N. J., well-known in the textile chemical specialty field, has entered the leather specialty field. The products offered to the leather industry are as follows: Aliphatic Ester Sulfate and Glyceryl Sulfates, which are completely sulfonated oils of maximum SO_3 content, some of which reportedly reach as high as 21% on a 100% flat basis.

Also included are phosphamized sulfonated oils, made by a special process which prevents oxidation. It is also said that numerous specialties will round out the line. Through facilities of its laboratories, the Onyx firm will also make up oils to meet tanners' specifications or will develop oils for special purposes.

Maher Color & Chemical, Chicago and San Francisco, is exclusive selling agent for Onyx in the Middle and Far West, where laboratory service will be available for tanners at all times. Leather oils and dyestuffs are to be stocked in these 2 cities for the convenience of all tanners in the territory.

Bradley F. Marthens, formerly in charge of the leather oil division of the F. W. Drew & Co., in the Middle West, will hereafter act in a similar capacity for Maher Color & Chemical.

Scholler Expands Canadian Factory

Scholler Brothers, Ltd., St. Catharines, Ont., is adding an important addition to its plant which will increase productive capacity 100%. Company is affiliated with Scholler Brothers, Philadelphia producer of soaps, softeners, and other chemical specialties for the textile trade.

Easy Method of Determining pH

Detergent Products, Atlanta, Ga., has issued a booklet "Textile Detergents" which gives a very easy table for the calculation of pH value in textile solutions.

Two New Dry-Cleaning Chemical Specialties

Two new products have appeared recently in the dry-cleaning field. "Adco Vanite Reagent" is particularly adaptable to the removal of soil. American Disinfecting of Sedalia, Mo., is the maker. "Nusope 48-B" is a product with excellent detergent properties and combines with this feature the ability to form stable emulsions of water and oils. Nuodex Products, Elizabeth, N. J., is the manufacturer.

New Producer of Dry-Cleaning Solvents

Hardin Chemical Corp. is a new company located in Cincinnati for the manufacture of solvents and other products required in the dry cleaning field. John L. Hardin, president and general manager, is a consultant and heads the John L. Hardin Laboratories, 951 Blair ave. Company also plans the manufacture of a cleaner for beer coils.

Two New Metal Detergents Marketed

Standard Supply, P. O. Box 1198, New Haven, Conn., is introducing "Mirror 54 Cleaner," to remove oil and grease prior to plating and enameling; also "Plater's Compound" for cleaning before plating nickel, copper, chromium, brass die castings, etc.

Properties of Silicate Paints for Concrete

The question of paints is one of vital interest, especially in view of the rapid and enormous increase in the construction of concrete and cement walls.

Cement necessitates a very special paint which must approach as closely as possible that of the surface which is to be painted, in order that as much homogeneity as possible is obtained between the paint and the covered surface.

For this purpose, specialists have developed paints with a basis of liquid silicates, in many cases potash silicates.

The cost of these paints is relatively not very high as their use presents no difficulty and they have the following advantages: The hardness of this newly developed paint increases as time passes, due to the prolonged action of CO_2 of the atmosphere on the silicate. The silicate usually sold in the trade is a composite varying between a bisilicate and a tetrasilicate which, under the action of the CO_2 of the air duplicates itself in an hydrated potash carbonate and in an amorphous silicate.

$$K_2O,\ 4SiO_2 + CO_2 = K_2CO_3 + 4SiO_2$$

A part of the amorphous silicate partially crystallizes in the form of a colloid silicate which recombines itself later with the potash carbonate to result in a monosilicate:

$$K_2CO_3 + SiO_2 = K_2SiO_3 + CO_2$$

The excess in silicate stays in an amorphous state and forms a very resisting vitreous cement. The layer of silica effectively protects against water and outside corrosions and gives to the mass properties of impermeability. The silicate brings about perfect incombustibility to inflammable materials; owing to the formation of a vitreous layer, colors are protected against action of disturbing agents and, as a result the brightness and the freshness of these paints resist the destructive influence of atmospherical agents for a long time.

Colors with a silicate basis applied on a cemented surface which is very porous and even friable, increase its resistance. As an example, stone for facades which is very soft and whose resistance is approximately 50 kilos per square centimeter, will, after receiving coats of silicated paint, resist pressures reaching as much as 10 times the initial resistance.

Although the good qualities of silicated paint are generally recognized, they are sometimes criticised, but this is due mostly to incorrect usage and to ignorance of essential principles. For example, a silicated paint should not be used to cover an oil paint or vice versa, because the alkalinity of the silicate would react unfavorably with greases and organic colors. This is the reason why it is absolutely necessary to use only mineral pigments for silicated coatings (ochres, ultra-marines, red lead, chrome salts, kaolin, barium sulfate, etc.).

On the other hand, silicates are recommended to give more brilliancy and more resistance to water paints and they allow repeated washings of these paints. In fact, surfaces coated with silicated water paints remain perfectly beautiful after several years.

When coating walls that have been saltpetered, one should not think that the silicate will remove the moisture; it should be used only in order to stop the passage of moisture after the wall has been coated. It is, therefore, necessary to remove the

parts which have been attacked by water and to repair the wall before painting it. Experience and various tests which have been made show that colors with a basis of potash silicate are superior to those prepared with soda silicate, the latter giving off white efflorescence.

The preparation of these colors calls for special precautions. The mass of the desired tint must be prepared in a sufficient quantity if a uniform tone is desired. As the work advances the silicate must be added in suitable quantities so that the solution will strictly remain 20/25° Beaume.

Methods of Operation: There are two methods of use. Either the silicate is brought in only as a fixative, or it enters into the manufacture of the color, the latter being the more common use.

Special Paints: Certain specialists have perfected various silicated paints destined to various uses. For example, in non-inflammable paints and insecticides for wood-work, canvas, fibers.

Paints for glass and porcelain should also be mentioned. In that case the use of a silicate solution 20/25° Beaume is advisable; the mixture must be absolutely homogeneous (emulsion).

Conclusion: Liquid glass is called to render enormous service in architecture, for the maintenance of already constructed buildings, as well as for the painting of concrete work and freshly prepared ceilings.

Boro-Phosphate for Textile Flame-Proofing

New developments in the flame-proofing of textiles is discussed by N. L. Deutsch, Glyco Products, N. Y. City, in the October issue of *Rayon Textile Monthly*, p69 (689). He states that all formulae in the literature will be found to contain 2 or more of the following ingredients:

Ammonium carbonate	Alum
Ammonium chloride	Aluminum acetate
Ammonium phosphate	Aluminum tungstate
Ammonium sulfate	Lead acetate
Borax	Sodium aluminae
Boric acid	Sodium stannate
Sodium Phosphate, dibasic	Zinc sulfate

He discusses the favorable properties of a boro-phosphate "resin" as a flame-proofing medium.

Simple Formula for Boil-Off

A simple formula for a boiled-off liquor is given in *The American Silk & Rayon Journal*: 2 lbs. Marseilles soap; 2½ ozs. gelatine; 2 ozs. common salt. The solution is made up to 10 gals.

Production of Rayon Anti-Static Dressings

A British patent covers the application of an anti-static dressing to rayon filaments or yarns which are about to be cut into staple fiber. This suggests that a list of a few materials which act to dissipate static electricity may be of interest for various uses. Their general use is, of course, not patented.

Mixtures may be made from diethylene glycol, water, magnesium chloride; or triethanolamine oleate or triethanolamine stearate with a trace of free triethanolamine. The amount to apply is 2 to 10% on the basis of 100 diethylene glycol to 30 water and 6, 7, or 10 of the other ingredients.

Anti-static materials which also have lubricating properties are used up to 2% and include emulsions of oil, water, and such substances as triethanolamine lactate, tartrate, citrate or borate; or similar salts of ethylene diamine or similar amines; also solutions of alkylolamine salts of fatty acids, like oleic, in glycols or other polyhydric alcohols. These offer a variety of possibilities for anti-static use. *Textile Colorist.*

Happenings in the Soap Field

H. H. Coleman, St. Louis manufacturer of soap and laundry supplies, has opened a branch at 2019 Grand ave., Kansas City, Mo.

The soap plant of J. T. Robertson Co. has again been bought in by the First Trust & Deposit Co., Syracuse. Bank, it is said, prefers to sell the property as a unit, rather than piecemeal.

Deupree Is Optimistic on Soap Sales Outlook

R. R. Deupree, P. & G. president, told stockholders at the annual meeting that for 1st quarter of the fiscal year, "business was good and it seems quite certain that it will be reasonably good in the 2nd quarter."

Household Specialties

"Electro-Sil" Approved by Automotive Labs.

Clapper Chemical, Everett, Pa., has received a Certificate of Merit from the Automotive Test Laboratories, of Chicago, which certifies that Electro-Sil has been tested and successfully passed the applied tests and awarded the official seal of approval. Electro-Sil is a re-silvering solution, cold dip, that re-silvers old automobile reflectors without use of batteries in less than a minute. Clapper Chemical is authorized to use the seal of the Automotive Laboratories on the product.

Owens-Illinois Designs Two New Containers

Magnetic Metal Polish (product of Magnetic Polish, St. Louis) is now marketed in new containers by Owens-Illinois. The same company has also redesigned containers for "Dixie White" made by Dixie Sales of Paterson, N. J.

New Products on the Market

Hei-Ho Products, City Island, N. Y. City, is producing a new hand soap for use on greasy hands and clothing. Product made in liquid and paste form can also be used on silks and rayons.

U. S. Soap, 102 Atwater st., Detroit, is now making "Supreme" laundry soap.

Noskrape Laboratories, Inc., of 4858 W. Lake St., Chicago, announce the perfection of a new and remarkably effective universal cleaner and stain remover, "DestainER", for a widespread range of different cleaning jobs.

Coates Brokerage to Market Aulwood Products

Organization of the Coates Brokerage Co., as the research and distributing agency for the Aulwood Manufacturing Co., 2233 University ave., Minneapolis, has been announced. New company will be the exclusive national distributors for Aulwood polishes.

News Briefs of the Household Specialty Companies

Terminex Iowa Co. is a new Des Moines firm in the termite control business, and will use the E. L. Bruce Co. system.

Coastal Chemical Manufacturers, Miami, has purchased a 2-story building at 55-59 N. E. 14th st., where it will produce chemicals for termite eradication, exterminating chemicals, and a general line of household chemical specialties.

National Chemical Products, 7600 Carnegie ave., S. E. Cleveland, announces that Harry Trottner, well-known in steel circles, is now with the company.

The Pepsodent Co., Chicago, has just been granted a patent on the use of "soapless soaps"—sulfated higher alcohols, in dentrifices by Patent No. 2,054,742.

The advertising campaign of the various companies marketing anti-freeze got under way in the last week in October. Publicker, Inc., National Carbon (Prestone), and U.S.I. had full pages in *The Saturday Evening Post.*

Beats Oil Products, Los Angeles, is now at 356 W. 56th st.

Harris Soap, Buffalo, has gone on the radio featuring "Oxygen Soap Flakes" and will shortly add a program for "Ready Suds."

Sherwin-Williams started the 2nd season of "Metropolitan Opera Auditions of the Air" on Oct. 18th. Program will be broadcasted at 3 P. M. every Sunday over the Red network and additional stations from Coast to Coast.

The Utility Co., Inc., N. Y. City, manufacturer of Gre-Solvent hand cleaners, appoints W. I. Tracy, Inc., N. Y. City, as advertising agency. Newspapers will be used.

California Ruling on Spray Labels

Secretary of the National Association of Insecticide & Disinfectant Manufacturers has mailed to all members a report on the situation on the labeling of pyrethrum powders and fly sprays in the state of California. It quotes Dr. Cox of the California Board as follows:

> "The Federal Government has stated that labels for pyrethrum insect powders or mineral oil-pyrethrum fly sprays cannot be labeled with unqualified claims such as 'non-injurious' or 'harmless', but at the present time it does not take exception to these with the addition of 'when used as directed.'"
>
> "We believe there is a potential source of danger in these materials, and to a child if it got an overdose. Pending further investigation this Division (California) will not take steps to enforce the removal, during the fiscal year ending June 30, 1937, of the statement on materials of this class 'Non-injurious to humans when used as directed.'"

It will be noted that the above announcement by Dr. Cox, applies only to pyrethrum powders and fly sprays and does not apply to rotenone, derris, or organic thiocyanates when used in fly sprays. This postponement relating to the use of the phrase "non-injurious to humans when used as directed," has been made to assist California manufacturers in meeting competition of products sold outside of California.

Acid Hand Wash Paste Shown at Leipzig

Considerable attention was attracted to a hand wash paste at the Leipzig Fall Fair in Germany. Chemical reaction of the product is acid rather than alkaline, a feature which is alleged to be more advantageous than the action of alkaline soaps. Details are available from the Bureau of Foreign & Domestic Commerce, Chemical Division, Washington.

Restrained from Imitating West's Bottles

The Herkimer Chemical Co., Atlantic Chemical Co., and Francis Kassel are restrained from selling disinfectants in bottles similar to those used by West Disinfecting of Long Island City or from attaching certain types of labels to the bottles, under the terms of an injunction granted by Justice George H. Furman in Special Term of the N. Y. Supreme Court, Jamaica, L. I.

Federal Trade Commission's Recent Rulings

The Federal Trade Commission has ordered the Blair Laboratories, Lynchburg, to cease from certain claims for Whitehouse Cleaning Fluid, Whitehouse Household Cement, and several other products made by the company.

Durand-McNeil-Horner Co., Chicago, selling "Klor-O-Wash," stipulates that it will desist from advertising that this cleaning compound is a deodorizer and disinfectant for chinaware, glassware, pots, pans, washbowls, bathtubs, tile floors, linoleum and sick room equipment, unless such representations are accompanied by instructions to the effect that the places or articles to be deodorized and disinfected should be thoroughly washed before using "Klor-O-Wash." Another representation that will be discontinued is that the product will remove alcohol, ink, coffee, tea, fruit, mildew and scorch stains from white cotton or linen fabrics by soaking the article for a few minutes in a solution of one part of "Klor-O-Wash" to 20 parts of water.

Wilbert Products, 805 E. 139th st., N. Y. City, engaged in selling a washing fluid designated "Javex", will cease representing that the product disinfects or deodorizes, unless directions are given for first cleansing the article to be disinfected or deodorized; that it kills all germs, including their spores, or destroys odors, and that it is "magical" in whitening clothes.

The Star Water Mfg. Co., Waterbury, Conn., agrees to discontinue representations that its "Star Water" washing fluid is a non-poisonous germicide and is safe; that it is an antiseptic, disinfectant or deodorant, without following such assertion with directions for cleansing the article to be disinfected or deodorized; and that it sterilizes, kills bacteria and disinfects when used to wash dishes.

Agricultural Specialties

Novel Combination of Latex, Fertilizer, Fungicides

Rubber latex in bulb and tuber treatment is suggested in an English patent, 448,849, '34, Group V. G. E. Heyl. Seeds, bulbs and tubers have applied thereto a coating consisting of a preserved latex containing one or more than one fertilizer, one or more than one fungicide with nitrogen-fixing bacteria being added if desired; preferably the coating consists of preserved latex containing a phosphate and a nitrate. As examples of fertilizers, potassium phosphate with ammonium nitrate, ammonia with or without coconut oil or potassium hydroxide or other alkali and coconut oil or a soap-forming oil with or without the addition of ammonia are mentioned; thus 1-10% of ammonia in solution may be employed. The latex may be diluted with water. Fungicides with or without nitrogen-fixing bacteria such as *clostridium pastoriannum* may be mixed into the latex.

California Spray Chemical Moves Plant

Removal of machinery of the California Spray Chemical Co. from Pittsburgh, Calif., to the new plant at Richmond, Calif., is nearly completed.

Detailed Study of Trade Marks Available

Vigilance in the protection of the goodwill in American-made goods by the timely acquirement of trade mark and patent rights and vigorous repression of all forms of unfair competition is necessary in order to combat the unscrupulous efforts of traders who derive an unjust profit through the adoption of unfair trade practices not only in American markets but throughout the world, according to a study recently made available by the Bureau of Foreign and Domestic Commerce, Dept. of Commerce.

Piracy may be effectively combatted only by seasonable action, it was stated. Millions of dollars are lost annually and, in some instances, entire markets may be closed through failure of the American manufacturer to exercise due diligence in obtaining those rights which may be acquired only by the fulfillment of certain legal formalities. Positive and definite action is essential in order to stamp out the fraudulent acts of the unfair trader, according to the Commerce Department.

Titled "Industrial Property Protection Throughout the World," the study was prepared by James L. Brown, Division of Commercial Laws, and is designed to acquaint the American manufacturer and trader with those industrial property matters which experience has proved to be necessary in the protection of established and potential markets for their goods.

Trade marks, labels, and other identifying media occupy a greater place in merchandising today than at any time in the past. Their position in industry as well as in law is included in a chapter devoted to them.

Information concerning this handbook may be obtained from the Division of Commercial Laws, Bureau of Foreign and Domestic Commerce, Washington, D. C. Copies may be had at 20c each upon application to the Superintendent of Documents, Government Printing Office, Washington, D. C., or any district branch of the Bureau of Foreign and Domestic Commerce.

Packaging, Handling and Shipping

Personnel Promotions in the Container Field

Dudley W. Figgis, formerly assistant to the vice-president in charge of sales of American Can, has been elected a vice-president and placed in charge of sales for the general line. He is well-known in paint association circles. Other executive changes in general line sales are: H. G. Edwards, formerly general manager of sales, has been appointed assistant to Dr. H. A. Baker, president. R. W. Phelps, formerly assistant to M. J. Sullivan, vice-president, San Francisco, has been appointed assistant to Mr. Figgis, with headquarters in N. Y. City. C. H. Black, formerly assistant general manager of sales, has been appointed general manager of sales. R. L. Sullivan, formerly Atlantic district sales manager, has been appointed assistant general manager of sales. W. C. Stolk, formerly assistant Atlantic district sales manager, has been appointed Atlantic district sales manager.

AMERICAN CAN'S FIGGIS

NATIONAL CAN'S CROSS

In consequence of the increasingly package-conscious tendencies of industry and the resultant mounting demands upon their Planning and Development Department, National Can announces the appointment of Jack M. Cross as manager of this Division. He was formerly identified with Continental Can in a similar capacity, and brings to his new connection an experience of 10 years in the successful designing and development of containers for emphasized sales appeal in the trade. In his departmental duties, Mr. Cross will have as his assistant, James M. Hoyt, who for several years has been active in this field.

Bureau of Explosives Hears Numerous Proposals

Bureau of Explosives on Oct. 6th held a public hearing on numerous proposals for amendments to the I.C.C.'s regulations effective Oct. 1, 1930, including the following: Du Pont to amend paragraph 69B, freight, so as to authorize the inclusion of a larger quantity of wet lead azide in the outside package; the Bureau to correct an apparent inconsistency to paragraph 278(k) and 277(c) on picric acid; du Pont to amend regulations in paragraph 278(g) so as to ship ammonium nitrate in specially prepared containers; du Pont to amend paragraph 324(A) so as to provide additional containers for sodium hydrosulfite; General Chemical and the Bureau to include specific packing requirements for perchloric acid; a proposal from the Bureau to definitely prohibit the use of any combustible packing material for bromine; proposal by the Bureau to include nitrochlorbenzene under its specific name; proposal by the Bureau to require a car containing one or more packages bearing the Poison Label, or poisonous articles, Class B, in bulk, or tank car containing any poisonous material, class B, to be protected by the Poisonous placards.

Also a du Pont request to amend express regulations on the shipment of pyroxylin plastics and the Bureau suggests a complete revision; a request from the Tret-O-Lite Co., St. Louis, to amend Specification 5E, in order that the application of the mark ICC-5E be permitted on the side wall of the drum as well as on the head. The Bureau opposed this request because the product "Tret-O-lite" is a nonhazardous article which does not come under the I.C.C. Regulations. The Bureau states the opinion that the prescribed requirements established in the past by the manufacturers of metal drums and the users thereof for the transportation of dangerous articles should not be changed at the instance of a shipper of nondangerous articles.

Du Pont requests amendment of the specifications in order to authorize the use of a "flash weld" under the provisions of subparagraph (d), paragraph 2, Specification 6H, in the manufacture of metal drums.

Several other important proposals were made at the hearing, including a proposed revision of Shipping Container Specification 16A, 16B, proposals on shipment of dichlorodifluoromethane, nitrocellulose wet with alcohol or other solvent, and a request to provide an additional container for benzyl chloride.

Procedure of the Bureau is to hold public hearings from time to time, and the next one is scheduled for Jan. 26, '37. All items for inclusion in that docket must be received not later than Dec. 24th. Bureau makes its recommendations to the I.C.C. Ninety days elapse after promulgations of rulings by that body before they become effective.

Double-Walled Container Patented

A design for a double-walled container, purpose of which is to secure insulation for the contents, has recently been patented by a John L. Kellogg of Chicago. An insulating material is placed between the 2 walls of the drum.

Suggests Wider Use of Convertible Containers

Convertible containers are discussed by Wilbur F. Howell in the October issue of *Shipping Management*, p11. He lists a number of products that lend themselves to such use of shipping cases and lists among the chemical specialties the following: cake soap, furniture polish, floor wax, scouring powders, hand cleaners, salt, soap powder, silver polish, shoe polish, insect sprays, glue, paint and varnish.

He adds: "Two things recently have made this new case possible and practical: 1st, the new arrangement of retail stores with less counters and more floor space, and 2nd, the ingenuity of shipping case manufacturers in designing convertible cases which are very simple for the retail merchant to set up."

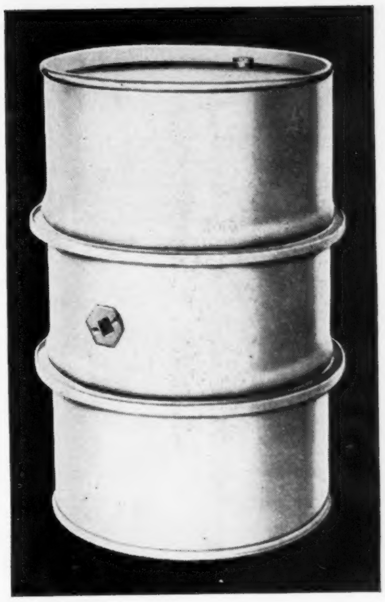
I.C.C. Modifies Rates on Fertilizer Materials

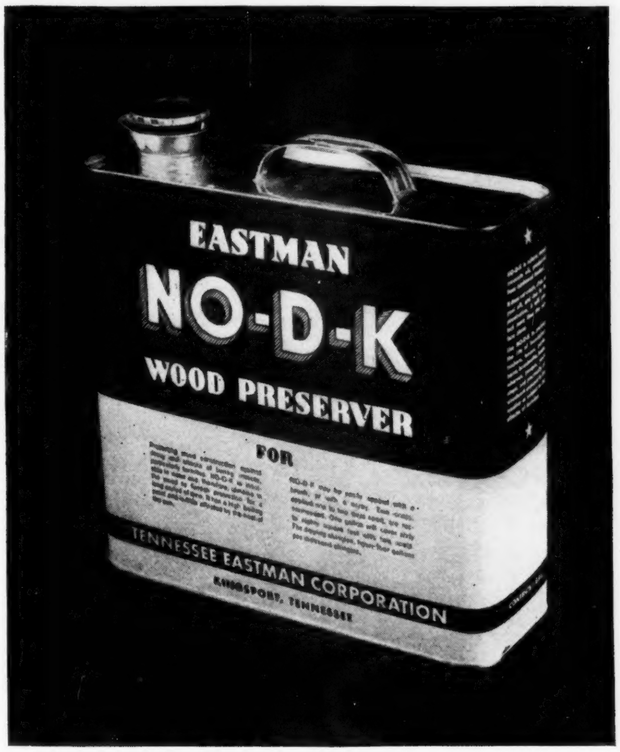
The I.C.C. on Oct. 5th modified its order of July 19, 1926, in connection with Docket No. 16295, Fertilizers and Fertilizer Materials Between Southern Points, as follows: "It is ordered, That said order be, and it is hereby, vacated and set aside in so far as it relates to rates on castor-bean hulls or stems, cocoa-bean shells, kapok seed meal, senna bean meal, peanut oil cake or oil cake meal, and soy (soja or soya) bean oil cake or oil cake meal; And it is further ordered, That in all other respects said order shall continue in effect until the further order of the Commission."

New Products—New Packages

An ink bottle that accomplishes the long-sought and seemingly impossible objective of putting the ink at the top, within easy reach, has been created by L. E. Waterman Co., N.Y. City. By turning the bottle upside down, ink completely fills the neck of the bottle and remains there when the bottle is returned to its base.

Stevens Metal Products, Niles, Ohio, is marketing drums and pails in varying sizes made of stainless clad steel. Ingclad stainless clad steel, produced by the Ingersoll Steel & Disc Division of the Borg-Warner Corp., Chicago, is used. Further details are given on page 499.





Tennessee Eastman is now marketing its quality wood preserver in these attractive one-gallon containers, opening up an entirely new field of merchandising-the home owner. Continental Can is responsible for the design.

Pacific Coast Borax gets deeper into the specialty field with a new hand cleaner. Package was designed by McCann-Erickson, N. Y. City advertising agency.

British Lubricating Oil Packages

Those responsible for the packaging of automobile oils will find a review, by an anonymous author, in the light of several years' experience of the pros and cons of sealed containers in the Oct. 17th issue of British, *The Petroleum Times* of real interest. He discusses the problem of bottles, cans, or metallized paper.

Malcolmson, Gair, Appointed

J. D. Malcolmson, Robert Gair, has been appointed by the U. S. Bureau of Standards, Dept. of Agriculture, chairman of the Simplified Practice Committee to standardize boxboard calipers.

Continental Builds at Malden, Mass.

Continental Can has given a contract to the Austin Co. for the erection of a new 3-story plant at Malden, Mass.

Kurth, Package Designer, in Larger Quarters

H. P. Kurth, well-known consultant on modern packaging, has moved to a larger studio in the Marbridge Bldg., 47 W. 34th st., N. Y. City.

Coming Conventions to Attract Many

The Convention of The Associated Cooperage Industries of America is scheduled for Nov. 11-12th, at the Brown Hotel in Louisville, Ky. The annual convention of the Packaging Machinery Manufacturers' Institute is being held on the same dates but at the Edgewater Beach Hotel in Chicago.

Advice on Winter Storage of Fine Chemicals

The latest issue of the *Merck Retort* contains valuable information on the storage of certain fine chemicals, reporting on the various temperatures at which the most common fine chemicals freeze.

COLUMBIA

Achievement

SODA ASH
CAUSTIC SODA
SODIUM BICARBONATE
MODIFIED SODAS
CALCIUM CHLORIDE
LIQUID CHLORINE

In 1899 the famous yacht Columbia, called by many the grandest yacht of them all, successfully defended the America's Cup against Sir Thomas Lipton's first challenger, Shamrock I.

In 1899 another Columbia was formed, also to lead the way. In its history of thirty-seven years **THE COLUMBIA ALKALI CORPORATION** has ever set the pace in serving industrial needs for **SODA ASH, CAUSTIC SODA, MODIFIED SODAS, CALCIUM CHLORIDE.**

This year the service has been expanded to include **LIQUID CHLORINE** and **SODIUM BICARBONATE**, produced in completely new plants with the most modern equipment.

Our technical service is at your disposal.

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COLUMBIA ALKALI
CORPORATION
EXECUTIVE SALES OFFICES 30 ROCKEFELLER PLAZA • NEW YORK, N. Y.
Branch Sales Offices • BARBERTON, OHIO • 431-451 ST. CLAIR STREET, CHICAGO
CAREW TOWER, CINCINNATI • GRANT BLDG., PITTSBURGH • Plant at Barberton, Ohio

New Trade Marks of the Month

347,045
BREVOLUX

347,047
BREVEX

354,661
NIAGARA

356,232
VITRA SEAL

367,451
SUPERKILL

369,358
MISTO

370,536
NATUREL

371,936
WHITE-WAVE
Washing Fluid

374,073
SANOLA

372,700
No-rub

373,181
McKESSON
QUALITY SINCE 1833

374,278
JIM DANDY

374,704
SUPERFLO

376,954
ELBASOL

377,705
PROOFTEX

376,970
PECTOCOL

377,777
LES CENT FARDS

378,000

378,002
SPEED ON
LINOLEUM
FINISH
STAYS ON

378,790
ORIGINAL
SEPTO
SHINE
ANTISEPTIC
POLISH

378,986
ER

Trade Mark Descriptions†

347,045. Brevolite Lacquer Co., North Chicago, Ill., to Atlas Powder Co., Wilmington, Del.; filed Feb. 7, '34; for paints, lacquers, polishes, etc.; use since April, '29.
347,047. Brevolite Lacquer Co., North Chicago, Ill., to Atlas Powder Co., Wilmington, Del.; filed Feb. 7, '34; for lacquers, paints, polishes, etc.; use since Sept., '31.
354,661. Rich Art Color Co., N. Y. City; filed Aug. 4, '34; for artists' paints, etc.; use since June 1, '34.
356,232. Sidney Prichard (Modern Process Flooring Co.); filed Sept. 20, '34; for paints, etc.; use since May, '32.
367,451. Taylor Chemical Co., Aberdeen, N. C.; filed July 18, '35; for insecticides, fungicides, and household disinfectants; use since Jan., '35.
369,358. Grand Union Tea Co., N. Y. City; filed Sept. 16, '35; detergent; use since June 5, '35.
370,536. Naturel Mfg. Co., Brooklyn, N. Y.; filed Oct. 17, '35; for shoe polishes, dressings, creams and cleaning compounds; use since May 1, '35.
371,936. Domenick Spadoni (White Wave Washing Fluid Co.), Chicago, Ill.; filed Nov. 23, '35; for washing fluids; use since Nov. 20, '35.
374,073. Art Brass Co., N. Y. City; filed Jan. 25, '36; for stopping leaks in liquid and gas receptacles, for removing obstructions from pipes and toilets and soldering flux; use since Dec. 24, '35.
372,700. Wilbert Products Co., N. Y. City; filed Dec. 16, '35; for furniture polish and floor wax; use since Oct. '30.
373,181. McKesson & Robbins, Fairfield, Conn.; filed Dec. 30, '35; drugs and chemicals; use since Jan. 1, '35.
374,278. Samuel C. Brody (Lasher-Weeber Co.), Boston; filed Jan. 30, '36; for liquid alcohol for use as fuel; use since Jan. 2, '32.
374,704. Boston Blacking & Chemical Co., Boston; filed Feb. 11, '36; for bottom finishes for shoes; use since Dec. 2, '35.
376,954. Elba L. Leonard, Livermore, Calif.; filed Apr. 8, '36; for cement for welding eye glass frames, films, etc.; use since Apr. 3, '35.
377,705. William M. Outon (Prooftex Laboratories), Chicago, Ill.; filed Apr. 27, '36; for non-explosive and non-burning sizing and dressing fluid for fabrics; use since Apr. 15, '35.
376,970. Wallerstein Co., Inc., N. Y. City; filed Apr. 8, '36; emulsifying agents; use since Nov., '27.
377,777. El Daltroff & Cie (Parfumerie Caron), Paris, France; filed Apr. 29, '36; soaps; use since Dec. 24, '35.
378,000. Progressive Varnish Wks., Los Angeles, Calif.; filed May 4, '36; varnishes; use since Feb. 8, '36.
378,002. Progressive Varnish Wks., Los Angeles, Calif.; filed May 4, '36; varnishes; use since Feb. 8, '36.
378,790. James Kanthe (Septo Products Co.), Detroit; filed May 23, '36; metal polish; use since Apr. 22, '36.
378,986. Erie Resistor Corp., Erie, Pa.; filed May 28, '36; moldings of plastic composition material; use since Jan. 21, '36.
379,046. Fritzsche Bros., N. Y. City; filed May 29, '36; natural and synthetic essential oils; use since Mar. 6, '36.

Chemical Specialty Patents*

Waterproofing fabric by application of oil soluble phenol-oil-aldehyde resinous complex and a plasticizer. No. 2,055,450. Howard L. Bender, Bloomfield, and Frank I. Bennet, Jr., Highland Park, N. J., to Johnson & Johnson, New Brunswick, N. J.
Treatment of bristles with urea, formaldehyde and glacial acetic acid to increase water resistance. No. 2,055,322. W. Kedzie Teller to Weco Products Co., both of Chicago.
Increasing water resistance of brush bristles by impregnation with a waxy substance and a water insoluble soap of a non-poisonous metal. No. 2,055,321. W. Kedzie Teller, to Weco Products Co., both of Chicago.
Wire insulation comprising a mixture of finely divided inorganic insulating material, a rubber-oil-resin binder and a boron compound. No. 2,055,223. Leon Robbin, New Rochelle, N. Y. to Vega Mfg. Corp., Wilmington, Del.
Buffing and polishing compound composed of a binder and a water soluble abrasive. No. 2,055,220. Paul R. Pine, Elyria, Ohio, to The Chandler Chemical Co., Cleveland.
Method of preparation of lubricating greases. No. 2,055,043. Roy F. Nelson, Nederland, Tex., to The Texas Co., N. Y. City.
Production of polycarboxylic acid esters suitable as softening and gelatinizing agents. No. 2,054,979. Michael Jahrstorfer and Hans Georg Hummel, Mannheim, Germany, to I. G., Frankfort, Germany.
Means and method of disposing of odorous gases dissolved in water. No. 2,954,966. Bert O. Crites, University Heights, Ohio, to The Gibbs Mfg. Co., Canton, Ohio.
Treatment of sewing thread with molten mixture containing 75 to 95% rosin and small amount of petrolatum, paraffin oil, rubber and water. No. 2,054,943. Alexander D. Macdonald, Yonkers, N. Y. to Boston Blacking and Chemical Co., Boston, Mass.
Impregnated material for shoe linings. No. 2,054,870. Willy Stelkens, Cologne, Germany, to C. F. Boehringer & Soehne G.m.b.H., Mannheim-Waldhof, Germany.
Gasket paste of heat treated hot and cold press castor oil, soft soap and glycerine. No. 2,054,801. Charles W. Bailey, Dayton, Ohio, to Blue Rock Chemical Corp., Virginia.
Formation of an insulating wall coating by spraying on glue, water solution containing suspended mica and sodium silicate. No. 20,117. Reissue. Laurence E. Power to Allen-Bradley Co., both of Milwaukee, Wis.
Plant spray comprising Diesel fuel emsulified with water by means of a bentonite clay and high speed agitation and containing an acid ion producing substance. No. 2,056,121. Walter Carter, Honolulu, Hawaii.
Liquid parting for use in metal casting operations. No. 2,056,048. Andrew Y. Gregory, White Plains, N. Y., and Eldridge E. Seeley, Fairfield, Conn.
Ball bearing lubricant comprising 14.5% sodium stearate, 6.9% sodium naphthenate, 77.89% medium heavy mineral lubricating oil, 0.32% free alkali, and a trace of water. No. 2,055,795. Gus Kaufman and Oney P. Puryear, Beacon, N. Y., to The Texas Co., N. Y. City.
Insulating material of granulated cork, a binder consisting essentially of sulfur and latex. No. 2,055,691. Pierre Michel Justin Bardou-Job and Henri Francis Hébrard, Perpignan, France, to Ré, Saint-Marguerite, Ceret, Pyrenees-Orientales, France.
Yarn wetting agent consisting of salts of polyamino bases and capillary active alkylated aromatic sulfonic acids. No. 2,055,588. Friedrich Pospiech to Chemische Fabrik Pott & Co., both of Pirna-Copitz, Germany.

(Specialty Patents continued on next page.)

* Patents covered in this issue include those appearing in the *U. S. Patent Gazettes*, September 22 to October 20.

† Trade-marks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, September 22 to October 20.

Specialty Patents (Continued)

Soap consisting essentially of an alkali metal salt of a higher fatty acid and an alkylolamine salt of an aromatic carboxylic acid. No. 2,055,-581. Jack Leben, Bushey, England, to Ormul Products, London, England.

Soap lather dispenser. No. 2,055,556. Merlin C. Ray Monmouth Products Co., both of Cleveland.

Insecticide having Edeleanu extract as the active ingredient. An insecticidal and germicidal base of hydrocarbons, alkali soap and cresylic acid. No. 2,055,491. William H. Hampton, Berkeley, Calif., to Standard Oil Co. of Calif., San Francisco.

Production of pour inhibitors for lubricating compositions. No. 2,055,482. Gardland H. B. Davis, Baton Rouge, La., to Standard Oil Development Co.

Detergent for removal of cellulose lacquer from the skin consisting of volatile lacquer solvent, soap, carbon tetrachloride, glycerine, filler, abradant and water. No. 2,056,916. Waldemar Blech to Thurlow G. Gregory, both of Cleveland.

Oil de-emulsifying process. No. 2,056,669. Max Powell, San Gabriel, Calif., to Specialty Sales Corp., Los Angeles

Dehydration of oil emulsions. No. 2.056,668. George D. Bavin, Los Angeles, and Max Powell, San Gabriel, Calif., to Specialty Sales Corp., Los Angeles.

Lubricating jelly. No. 2,056,594. Henry A. Ambrose to Gulf Research & Development Co., both of Pittsburgh.

Bricks, slabs, sheets, etc. containing 20 to 80% shavings and the remainder vulcanizable rubber mix. No. 2,056,558. George William Beldam, Lower Bourne, Farnham, England.

Toxic spray of hydrocarbon oil and chaulmoogra oil. No. 2,056,529. Frank F. Lindstaedt, Oakland, Calif.

Production of a surfacing material from shell and bitumen. No. 2,056,520. Willie L. Holbrook and William R. Parker, Houston, Tex.

Extraction of toxins from roots for the manufacture of insecticides. No. 2,056,438. Harold Greig Ward, Wallasey, England.

Manufacture of a dry waterproof mix for plaster and paints containing lead stearate. No. 2,056,387. Edward H. Canon and Benjamin C. Canon.

Production of wetting, detergent, and emulsifying agents. No. 2,056,272. Karl Hennig, Rosslau/Anhalt, Ger., to Deutsche Hydrierwerke Akt., Berlin-Charlottenburg, Ger.

Insecticidal spray consisting of neutral fatty acid soap of an alkali metal, casein and petroleum sulfonic salts in aqueous solution. No. 2,056,238. William Hunter Volck, Watsonville, Calif., to California Spray-Chemical Corp., Berkeley, Calif.

Decalcomania for decoration of metal. No. 2,057,625, John B. Carr, Detroit, Mich., and Samuel P. Wilson, Lakewood, Ohio, to The Meyercord Co., Chicago.

Semi-solid plastic lubricant composed of an oxidized naphthenic base petroleum residuum, light paraffinic petroleum lubricant and a drying oil. No. 2,057,473. Eli F. Burch, Laurel Springs, N. J., to Cities Service Oil Co., Philadelphia.

Dental impression material comprised of fatty acid pitch jelled with a metallic soap. No. 2,057,456. Raymond B. Stringfield to Dental Plastics Co., both of Los Angeles.

Production of artificial stone composed of organic filler, stone powder, calcium chloride, sodium sulfate, calcium carbonate and hydraulic binder. No. 2,057,330. Ernst Heinrich Eichert, Weinsberg, Ger., one-half to Martin Weger, Schweinfurt-on-the-Main, Ger.

Coating composition for dental models consisting of 9½ oz. of cellulose acetate, viscosity 5, 8 oz. triphenyl phosphate, 25 cc. dimethyl phthalate, 25 cc. formaldehyde and 3½ qts. of dioxane. No. 2,057,289. Otis T. Birdiebough and George E. Luce, Yakima, Wash.

Sludge-resistant mineral lubricating oil containing 0.1 to 0.5% alkali metal alcoholate. No. 2,057,212. Bernard H. Shoemaker, Hammond, Ind., and Kenneth Taylor, Chicago, Ill., to Standard Oil Co. (Ind.), Chicago.

Process and apparatus for making bar soap. No. 2,057,192. Willis A. Hutton, Seattle, Wash.

Cleaning of feed water heaters with a paraffin oil-coal oil mixture. No. 2,057,189. Frank H. Graham and Vern D. Washbrun, Jackson, Mich.

Manufacture of "wax-resin" pour point depressors. No. 2,057,104. Frederick H. MacLaren, Calumet City, Ill., and Thomas E. Stockdale, Hammond, Ind, to Standard Oil Co. (Ind.), Chicago.

Insecticide and parasiticide with dihalogenated butene as the active ingredient. No. 2,-057,044. Kurt Meisenburg, Leverkusen-I. G. Werk, and Hans Kükenthal, Cologne-Flittard, Germany, to Winthrop Chemical Co., N. Y. City.

Impermeable bituminous sheets and their application. No. 2,057,020. Jacob Mitchell Fain, Brooklyn, and Adolph Barthel, N. Y. City.

Specialty Patents concluded on next page.

379,046
AVRYLLIS

379,248
FALBALAS

379,096
HUMBLE

379,405
OIL-O-SORB

379,750
"249"

379,850

379,884
DUR-A-CLOTH

379,975
SAFEWAY CORD

380,035
STOP-RITE

380,049
Franklin's GREEN LABEL PRODUCTS

380,086
STAKILD

380,129
Industrosol

380,194
AA

380,195
AAA

380,240
PENETREM

380,314
SNO-FLAKE

380,511
ZEPHYR

380,526
ASEPTISIL

380,542
bālab

380,550
CEM-BLACK

380,553
BLAC-KING

380,573
BIG W

380,688
ZEOLIN

380,814
PHOS-COPPER

380,911
Cee-Pee

381,007
MOR-LUBE

381,058
BEAM'S SUPER-GRO FERTILIZER

Descriptions

379,248. Lucien Lelong, Inc., Chicago; filed June 3, '36; soap; use since Nov. 13, '35.

379,096. Humble Oil & Ref. Co., Houston, Tex.; filed June 1, '36; furniture polishes and hydrocarbon solvents for paint and lacquer; use since Feb. 10, '36.

379,405. Frank D. Strickler (Waxene Products Co.), Wichita, Kan.; filed June 6, '36; for powdered material for absorbing oils and greases; use since July 15, '35.

379,750. Patek & Co., San Francisco; filed June 15, '36; spot remover; use since April 1, '36.

379,850. Shell Oil Co., San Francisco; filed June 17, '36; lubricants; use since June 4, '36.

379,884. Durkee-Atwood Co., Minneapolis, Minn.; filed June 18, '36; chemically treated cleaning cloth; use since Mar. 19, '36.

379,975. Safeway Products Corp., N. Y. City; filed June 19, '36; transparent cellulose acetate sheets; use since June 17, '35.

380,035. Chicago Hydraulic Oil Co., Chicago; filed June 22, '36; shock absorber fluid; use since Apr. 20, '35.

380,049. Joseph R. Franklin (Hammond Exterminating Co.), Hammond, Ind.; filed June 22, '36; rodent eradicator, insecticides, and disinfectants; use since Feb. 4, '35.

380,086. S. S. Stafford, Inc., N. Y. City; filed June 22, '36; insecticides; use since Feb. 1, '36.

380,129. Harry J. Theobald, doing business as Industrial Soap Works, Kearny, N. J.; filed June 23, '36; soaps; use since Jan., '35.

380,194. The Eagle-Picher Lead Co., Cincinnati, Ohio; filed June 25, '36; zinc oxide and leaded zinc oxide paint pigments; use since Oct. 10, '31.

380,195. The Eagle-Picher Lead Co., Cincinnati, Ohio; filed June 25, '36; zinc oxide and leaded zinc oxide paint pigments; use since Jan. 21, '21.

380,240. The Tremco Mfg. Co., Cleveland; filed June 25, '36; floor coatings; use since Oct. 2, '32.

380,314. Sno-Flake Products Co., Detroit; filed June 26, '36; polishes for white leather; use since April, '34.

380,511. The Goodyear Tire & Rubber Co., Akron, Ohio; filed July 2, '36; auto top dressing; use since June 23, '36.

380,526. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.; filed July 2, '36; bactericidal detergents for washing bottles; use since June 23, '36.

380,542. Balab, Ltd., San Francisco, Calif.; filed July 3, '36; auto cleaner; use since Aug. 24, '35.

380,550. Clinton Metallic Paint Co., N. Y. City; filed July 3, '36; cement colors; use since May 19, '36.

380,553. Colloidal Pigment Co., N. Y. City; filed July 3, '36; cement colors; use since May 19, '36.

380,573. Kutol Products Co., Cincinnati, Ohio; filed July 3, '36; wall paper cleaner; use since July 1, '36.

380,688. Cross Engineering Co., Kansas City, Mo.; filed July 3, '36; oil well drilling muds, suspensions, emulsions; use since May 1, '36.

380,814. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; filed July 8, '36; welding alloys; use since May, '30.

381,128
Pronto

381,152
ELECTRO SEAL

381.158
Pōlöid

381,183
ZEOSOLVE

381,247
Avenol

381,260
G PLUS

381,296
VAL-WHITE

381,298

381,299
VAL-OIL

381,314
Ronilla

381,386
T

381,422
RAYLIG

381,432
SURPRISE POLISH

381,469
STAR★BRITE

381,480
NO!NO! DOGGIE

381,455
TWINTAK

381,608
RDA

381,622
CLARAY

381,639
META-KLEEN

381,728
BIG SIX

381,665
RDA

381,733

381,761
Serwall

Descriptions

380,911. Milton Hanlon (Chemical Products Co.), Kansas City, Mo.; filed July 11, '36; insect exterminators, poultry tonic and spray; use since Dec. 22, '28.
381,007. Socony-Vacuum Oil Co., N. Y. City; filed July 14, '36; lubricants; use since June 30, '30.
381,058. D. A. Beam Fertilizer Co., Shelby, N. C.; filed Aug. 10, '36; fertilizer; use since Jan. 1, '34.
381,128. The Kwik Kindler Mfg. Corp., New Haven, Conn.; filed July 17, '36; kindlers; use since Feb. 15, '36.
381,152. Electro Seal Products, Erie, Pa.; filed July 18, '36; waterproofing and insulating compounds for electrical systems; use since Apr. 1, '32.
381,158. J. C. Fulkerson, Butler, Mo.; filed July 18, '36; for furniture, auto, and floor polishes; use since May 15, '36.
381,183. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.; filed July 18, '36; chemical solvent refrigerant in absorption refrigerating apparatus; use since May 26, '36.
381,247. R. Avenarius & Co., Stuttgart, Ger.; filed July 20, '36; preparations for protection of trees against parasites; use since Jan. 30, '34.
381,260. Lee W. Cooney, Lakewood, Ohio; filed July 21, '36; colloidal graphite as lubricant; use since June 1, '35.
381,296. Valentine & Co., N. Y. City; filed July '36; paints; use since Feb. 28, '35.
381,298. Valentine & Co., N. Y. City; filed July 21, '36; metal primer; use since Apr. 10, '36.
381,299. Valentine & Co., N. Y. City; filed July 21, '36; paint oil; use since Mar. 7, '36.
381,314. I. G., Frankfort, Ger.; filed July 22, '36; lacquers; use since May 25, '36.
381,386. Tennessee Eastman Corp., Kingsport, Tenn.; filed July 23, '36; cellulose acetate molding compositions; use since June 1, '36.
381,422. Rainier Pulp & Paper Co., San Francisco; filed July 24, '36; road surfacing compounds, emulsions; use since Jan. 18, '36.
381,432. Surprise Polish Co., N. Y. City; filed July 24, '36; furniture polish; use since June, '34.
381,469. Star-brite Paint Co., Chicago; filed July 25, '36; paints, enamels, varnishes, polishes, etc.; use since July 14, '36.
381,480. Halstead Products Co. (Garden Chemical Co.), Oakland, Calif.; filed July 27, '36; animal repellent; use since Apr. 24, '35.
381,455. Graeme Harrison Products, Inc., N. Y. City; filed July 25, '36; adhesive tape; use since Mar. 25, '36.
381,608. Dewey and Almy Chemical Co., Cambridge, Mass.; filed July 30, '36; dispersing agents in preparation of pigments, colors, calcareous, and aluminous substances; use since Mar. 31, '36.
381,622. The International Printing Ink Corp., N. Y. City; filed July 30, '36; printing inks; use since July 17, '36.
381,639. Riddiford Bros., Inc., Chicago, Ill.; filed July 30, '36; washing powder; use since Nov., '35.
381,728. Rotenone Chemical Co. (Stewart & Co.), Los Angeles; filed Aug. 1, '36; for flea and lice powder for animals; use since June 20, '36.
381,665. Dewey & Almy Chemical Co., Cambridge, Mass.; filed July 31, '36; dispersing agents in preparation of pigments, colors, calcareous, and aluminous substances; use since Mar. 31, '36.
381,733. Sparlets Corp., N. Y. City; filed Aug. 1, '36; for bulbs or capsules for compressed or liquefied gas; use since June '35.
381,761. Godchaux Sugars, Inc., New Orleans, La.; filed Aug. 3, '36; low density pith for explosives; use since June 29, '35.
381,796. American Anode Inc., Wilmington, Del., and Akron, Ohio; filed Aug. 4, '36; aqueous synthetic rubber dispersions; use since Apr. 14, '36.
381,851. O. M. Scott & Sons Co., Marysville, Ohio; filed Aug. 5, '36; fertilizer; use since Aug., '28.

Specialty Patents (Concluded)

Device for the prevention of scale formation in boilers. No. 2,058,370. John Merritt Thompson, Menominee, Mich.

Tennis court surface dressing composed of 10-30% of a drying oil, 50-80% rosin, and 10-20% of a petroleum oil of 20-40° Bé. No. 2,058,335. Peter Mayo, Evanston, Ill.

Lubricating grease consisting of 10-25% soda soap of oxidized paraffin wax and hydrocarbon lubricating oil. No. 2,058,237. Gus Kaufman and Oney P. Puryear, Beacon, N. Y., to The Texas Co., N. Y. City.

Lubricating grease for high speed ball and roller bearings composed of soda-lime soap of stearic acid and light lubricating oil. No. 2,058,236. Gus Kaufman and Oney P. Puryear, Beacon, N. Y., to The Texas Co., N. Y. City.

Insecticidal solution containing derris or pyrethrum or both in at least one member of the following: safrol, anethol, methyl eugenol and camphor oil. No. 2,058,200. Robert Wotherspoon, East Orange, N. J., to Derris, Inc., N. Y. City.

Adhesive coating composition comprising chlorinated rubber, chlorinated paraffin and a volatile solvent. No. 2,057,999. Walter D. Bowlby to Hercules Powder Co, both of Wilmington, Del.

Staple fiber treating composition of wax and aqueous solution of a reaction product of casein and aluminum formate having no free aluminum ions. No. 2,057,960. Leroy A. Kramer to Victor Chemical Wks., both of Chicago.

Process of removing the carbolic or iodoform odor from bleached plastic soap by treating them with a reducing salt of an oxygen compound of sulfur. No. 2,057,959. Waldemar Kling to I. G., both of Frankfort, Ger.

Method of producing an artificial skating rink with a surface composed of a fused mixture of synthetic hard wax and a tar product. No. 2,057,906. Ernst Murmann assignor of one-half to Christian Prell, both of Feldsberg, Czechoslovakia.

Machine for making lather from soap cakes. No. 2,057,791. Melvin Rolstad, Mankato, Minn.

Colored roofing granules and method of manufacture. Nos. 2,057,677, 2,057,678, and 2,057,679. Henry R. Gundlach, Baltimore, Md., to Central Commercial Co., Ill.

Waterproofing composition for fabric composed of casein and aluminum formate. No. 2,057,675. Hans B. Gottlieb, Chicago Heights, Ill., to Victor Chemical Wks., Chicago.

N.A.I.D.M. Program Ready

Program for the meeting of the National Association of Insecticide & Disinfectant Manufacturers to be held at the Penn Athletic Club, Philadelphia, Dec. 7-8th, is now complete. Copies are available through the secretary, John H. Wright, 122 E. 42nd st., N. Y. City. Among the addresses will be: "Trends in the Sanitary Specialties Business," by C. L. Weirich, The C. B. Dolge Co.; "The Robinson-Patman Act," by James F. Hoge, general counsel, Proprietary Association; "Correct Technique for Running the Peet-Grady Test," by A. G. Grady of Sinclair Refining. Dr. Alvin J. Cox, Chief, Division of Chemistry, Dept. of Agriculture, California, will interpret the California Economic Poisons Act. A floor discussion on the outlook for the pyrethrum market will be held. In addition, detailed reports will be given by the various standing committees.

381,796
AMERITE

381,851
TURF BUILDER

381,873
PERFECT SOLVENT

381,875
PANTHER

381,902
LOROLAV

381,940
DIKTATOR

381,944
KIRPO

381,945
KIRMA

382,052
Deli-clene

382,060
PHARMASOLS

382,109
KINKSETTOLIT

382,110
LUBRIKNIT

382,120
BOMEX

382,148
ARIDEX

382,161
MOTH-O-RIZE

382,201
NO-TRIK

382,215
GYROCOIL

382,274
DEFLUORITE

382,352
HYDROSET

382,367
2500

382,384
AVITEX

382,592
ZEPHYR

382,383
TUFFALT

382,607
RID-O-MOTH

382,608
LIQUIDSTONE

Descriptions

381,873. Louis Nekritz (The Perfect Polish Co.), Brooklyn, N. Y.; filed Aug. 6, '36; hand soap; use since Mar. '15.

381,875. Panther Valley Chemical Co., Lansford, Pa.; filed Aug. 6, '36; powdered and liquid ink; use since June 26, '36.

381,902. Bostonia Products Co., Boston, Mass.; filed Aug. 7, '36; soap; use since July 31, '35.

381,940. Hall Hardware Co., Minneapolis, Minn.; filed Aug. 8, '36; asbestos plastic cement and asphaltic lap cement; use since Feb. 1, '34.

381,944. Kirkman & Sons, Inc., Brooklyn, N. Y.; filed Aug. 8, '36; soap powder; use since Nov., '35.

381,945. Kirkman & Sons, Inc., Brooklyn, N. Y.; filed Aug. 8, '36; soap and soap chips; use since March, '32.

382,052. Robert T. Gardner (Gardner Co.), Germantown, Philadelphia, Pa.; filed Aug. 11, '36; cleaning powder and dry cleaning liquid; use since Oct. 30, '35.

382,060. Pharma Chemical Corp., N. Y. City and Bayonne, N. J.; filed Aug. 11, '36; dyes; use since Oct. 19, '33.

382,109. American Textile Engineering, Inc., Kearny, N. J.; filed Aug. 13, '36; treatment of textile fibers; use since Aug. 3, '36.

382,110. American Textile Engineering, Inc., Kearny, N. J.; filed Aug. 13, '36; treatment of textile fibres; use since Aug. 3, '36.

382,120. H. W. Hoffman (Bomex Products Co.), Buffalo, N. Y.; filed Aug. 13, '36; disinfectants, deodorants, and germicides; use since June 3, '36.

382,148. Du Pont, Wilmington, Del.; filed Aug. 13, '36; textile finish, water repellent; use since Apr. 15, '35.

382,161. Moth-O-Rize Co., Chicago, Ill.; filed Aug. 14, '36; mothproofing compound; use since July 6, '36.

382,201. Edward J. Bruss (The No-Trik Co.), West Allis, Wis.; filed Aug. 15, '36; household cleanser; use since July '36.

382,215. Hercules Powder Co., Wilmington, Del.; filed Aug. 15, '36; electric blasting caps; use since Aug. 3, '36.

382,274. National Aluminate Corp., Chicago, Ill.; filed Aug. 17, '36; chemicals to remove fluorine and silica from water; use since July 29, '36.

382,352. A. P. Green Fire Brick Co., Mexico, Mo.; filed Aug. 19, '36; refractory; use since May 18, '36.

382,367. Una Welding, Inc., Cleveland, Ohio; filed Aug. 19, '36; welding rod and welding wire; use since Feb. 1, '36.

382,384. Du Pont, Wilmington, Del.; filed Aug. 2, '36; water softener for use on textiles; use since Aug. 3, '36.

382,592. The Goodyear Tire & Rubber Co., Akron, Ohio; filed Aug. 26, '36; automobile polish; use since June 23, '36.

382,583. Andresen Corp., Chicago, Ill.; filed Aug. 26, '36; paving material; use since Aug. '34.

382,607. Standard Naphthalene Products Corp., Kearny, N. J.; filed Aug. 26, '36; moth preventative; use since Apr. 25, '23.

382,608. Standex Corp., Los Angeles, Calif.; filed Aug. 26, '36; water paint; use since May 27, '36.

Fumigators Hold Convention

Each succeeding year brings greater enthusiasm for the annual convention conducted by the National Association of Exterminators and Fumigators. Over 300 attended the 4th Annual Convention at Hotel Statler, Cleveland, Oct. 26-27-28th. Among the speakers were Dr. E. A. Back, principal entomologist, Insects Affecting Man and Animals, Bureau of Entomology, Dept. of Agriculture; Dr. Walter Heerdt, European Authority on Fumigations, Dr. C. L. Williams, assistant surgeon general, U. S. Public Health Service; R. A. St. George, entomologist, Division of Forest Insects, Bureau of Entomology; Prof. J. J. Davis, Purdue University; E. M. Mills, Bureau of Rodent Control, Amherst, Mass.; Mr. G. C. Oderkirk, Bureau of Biological Survey, Lafayette, Ind.; Dr. John Kreer, St. Louis, Mo.; Dr. T. A. Parks, Ohio State University; and several representatives of manufacturers and supply houses.

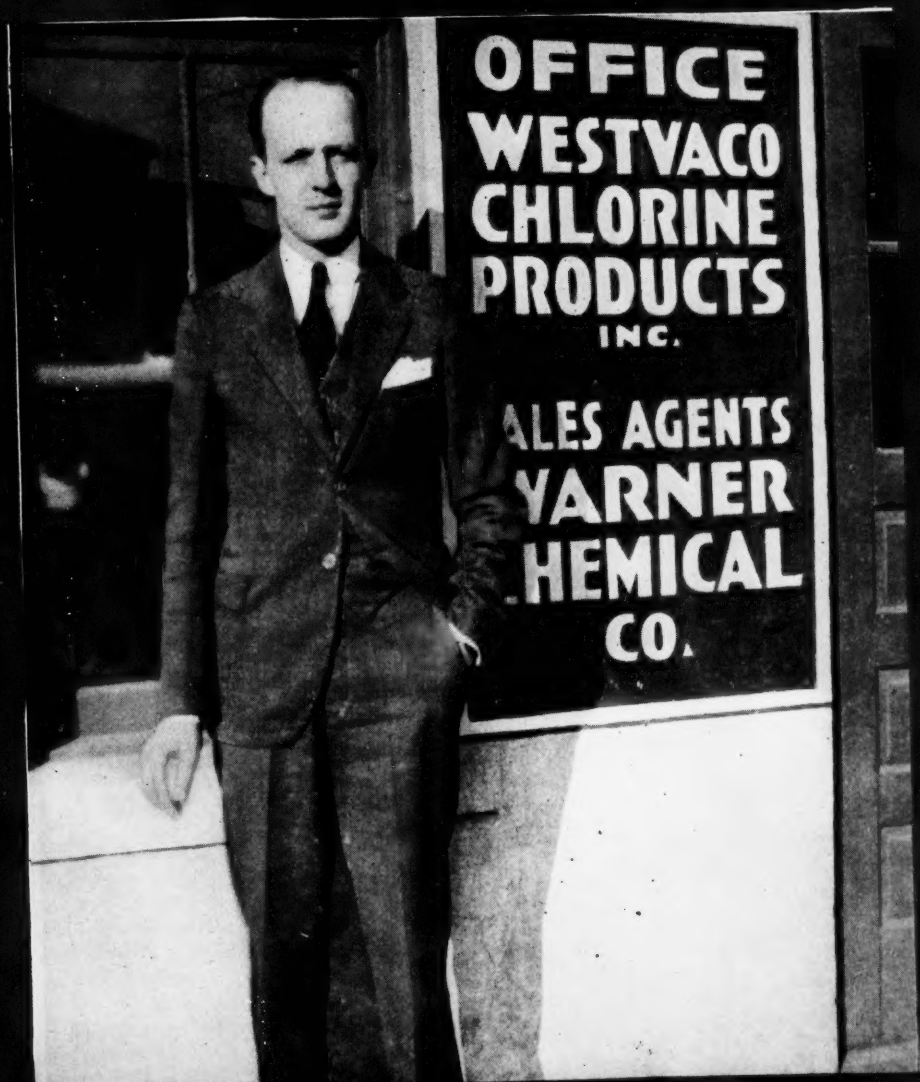
Emphasis this year was placed on research clinics having as their purpose the "question and answer" method whereby those attending would not only find it possible to enter into such discussion among themselves but also receive the advantage of having interpreted technical matters by those who formed what might be termed a technical staff. Among those who assisted in addition to the speakers were Dr. Alfred Weed, Dr. George B. Chapman, C. A. Vincent-Daviss, Harold B. Noble, Fred Hubbell, Thomas A. O'Leary, Irving H. Josephson, P. Calvert Cissell, Charles Denny, Arthur Srebren, Wallace B. Tanner, T. S. Darling. Motion pictures and other slides provided by Dr. Walter Heerdt on European fumigations; du Pont entitled the "Wonder World of Chemistry"; Wallace Tanner on termites and Dr. E. A. Back on carpet beetles were unusually interesting.

New officers of the association are: president—Bartlett W. Eldredge, Waltham Chemical, Waltham, Mass.; regional vice-presidents Milton G. Jorgenson, Los Angeles, Calif.; Harry H. Hammond, Milwaukee, Wis.; Otto Orkin, Atlanta; William A. Elliott, Brooklyn; Martin Meyer, Philadelphia. William O. Buettner, Brooklyn, was re-elected secretary, and the treasurer is H. K. Steckel, Columbus, Ohio.

Directors for 3 years (1936 to 1939) are: C. Norman Dold, Chicago; Edward H. Arnott, Indianapolis; Wallace B. Tanner, Los Angeles; Gilbert M. Stover, Baltimore; A. E. Ritt, Philadelphia; William Phippard, Cincinnati; and Clark R. Bergseth, Tulsa.

To complete the unexpired terms of Dr. E. D. Wilson who no longer is actively engaged in the industry, Irving Sameth, N. Y. City, was elected, and to fill the vacancy due to Mr. Eldredge's election to the presidency, F. E. Bohman, Hartford, was chosen.

CHEMICAL NEWS & MARKETS



COMPANIES ABSORB SUBSIDIARIES

Koppers, duPont, Davison Chemical, Virginia-Carolina Chemical, and Hercules Powder Announce Consolidations and Simplification of Corporate Structures. New Corporation Tax Laws the Compelling Reason for Such Moves—

The name of Koppers Gas and Coke Co., Pittsburgh, Pa., has been changed to Koppers Company. Three subsidiary companies have been or will be dissolved and will become divisions of the parent company. They are: The Koppers Construction Co., which becomes the Engineering and Construction Division; Koppers Products Co., which becomes the Tar and Chemical Division, and The Bartlett Hayward Co., which becomes the Bartlett Hayward Division. The Western Gas Division of Koppers Construction becomes a division of Koppers Company as does the American Hammered Piston Ring Division of The Bartlett Hayward Co. The Maryland Drydock Co., The White Tar Co. of New Jersey, Inc., and The Wood Preserving Corp. remain as subsidiaries of Koppers Company. Officers of the former subsidiaries will become officers of Koppers Company. To avoid similarity of titles, the name of The Koppers Company, parent company of Koppers Company, will be changed to Koppers United Co.

Activities of Koppers Company, through its subsidiaries and divisions, include the designing, construction and operation of by-product coke plants, gas producers, tanks, holders and other gas apparatus, wood preserving plants, and dry docks, and the production and sale of motor benzol, ammonium sulfate, naphthalene, phenol, Tarmac road materials, roofing products, tar acid oils, pitch and other coal tar products, machinery and steel mill equipment, piston rings and packing. It is understood that a refunding of Koppers Company's bonds is contemplated as a further step in the reorganization program.

Now the Grasselli Department

In the last month the definite announcement of the change from the Grasselli Chemical Co. to the Grasselli Chemical Department of the E. I. du Pont de Nemours & Co. was also released. Such action was, of course, expected in the trade when the announcement was made several months ago of the proposed shift of the Grasselli headquarters to Wilmington.

This trend towards elimination of subsidiaries wherever possible was also touched upon by President Chester F. Hockley of Davison Chemical recently in a statement directed to the company stockholders. He stated: "Since the formation of the new corporation, the management has merged a number of subsidiaries into the parent company. Steps are now being taken to effect further mergers so that before the end of the present fiscal year the management anticipates that all subsidiaries will be merged into the Davison Chemical Corp. This is expected to result in simplification and economy of operations."

Phosphate Products Dissolved

Another company to simplify its corporate structure is Virginia-Carolina Chemical which has dissolved Phosphate Products Corp. and has formed the Phosphate Products Division of the Virginia-Carolina Chemical Corp. Main offices of the Division will be in Richmond, Va., and a sales office in N. Y. City, will be continued.

Hercules Powder has acquired the assets of its subsidiary, Paper Makers Chemical. Paper Makers was operated as a separate company since October, 1931, when it became associated with Hercules.

The business, formerly conducted by Paper Makers Chemical Corp., will be continued by the Paper Makers Chemical Dept. of Hercules Powder. W. J. Lawrence, formerly president of PMC, has been elected a vice president of Hercules Powder and general manager of its Paper Makers Chemical Dept.

August Exports $12,661,300 — Imports $11,700,000

Export Trade in Sulfur Shows Remarkable Recovery in Face of Severe Competition—Good Demand for Chemical Specialties—Sharp Rise in Imports of Drying Oils—Perilla Imports at Record Figure—

Chemical exports of $12,661,300 in August compare favorably with the '35 figure of $12,204,000, the '34 figure of $10,612,000, and the net total of $9,434,000 in '33. August imports were valued at $11,700,000, as compared with $12,481,000 in July and $7,939,600 in August of last year, preliminary figures released by the Chemical Division, Bureau of Foreign and Domestic Commerce show. Since the beginning of the current year foreign countries have purchased more than 100 million dollars worth of American chemical products—a value increase of approximately 55% over the first 8 months of '33.

Demand for specialties was especially active in August, total value reaching $1,800,800 compared with $1,162,000 in August last year. Polishes; textile specialty compounds; water softeners and purifiers; synthetic resins; pyroxylin products; and household and agricultural insecticides were prominent with most items recording substantial gains over August, '35.

Demand for industrial chemicals continues active. Exports not including sulfur, aggregated $1,766,000 in August compared with $1,675,000, for the corresponding month of last year.

Sulfur Shipments Up

Export trade in American sulfur has recovered remarkably during the current year. Shipments in August aggregated 53,611 tons, valued at $1,006,300, bringing total for the first 8 months of the current year to 402,132 tons, compared with 247,800 tons during the corresponding months of '35.

Shipments of naval stores continued heavy in August, total value aggregating $1,833,800 compared with $1,740,000 in August last year. Approximately 109,660 bbls. of rosin and 1,461,850 gals. of turpentine were shipped to world markets during the month.

In the fertilizer group, shipments of certain materials including ammonium sulfate and phosphate rock declined somewhat but exports of potash aggregating 10,134 tons were almost 300% higher than in August last year when 2,638 tons were shipped to foreign markets. Since the beginning of the current year exports of potash materials have exceeded 71,000 tons compared with 41,250 tons during the first 8 months of '35, and less than 18,000 tons in the corresponding months of '34.

Exports of paint products were valued at $1,419,000 in August compared with $1,286,000 during the corresponding month of last year. The increase was due largely to heavier shipments of gas blacks which advanced from 9,500,000 to 12,550,000 lbs.

Imports Largely Raw Materials

As in preceding months more than three-quarters of the import total was made up of crude and processed materials, largely drying oils, waxes, pyrethrum flowers, gums, resins, casein, crude iodine and glycerine, cinchona bark and other materials destined for industrial consumption.

Drying oils continued to feature the list. Receipts, chiefly from China and Japan, exceeded 18,000 tons, valued at approximately 3½ million dollars compared with 9,000 tons, valued at 1½ million dollars, during the corresponding month of last year.

Imports of Manchurian perilla oil, reached the record figure of 18,727,000 lbs., valued at $1,279,000, during the month bringing the total for the first 8 months to 118,000,000 lbs., valued at

$7,000,000. During the corresponding months of last year receipts of perilla aggregated 55,600,000 lbs., valued at $3,-400,000. Imports of tung declined somewhat in August to 7,950,000 lbs., compared with receipts of 9,454,500 in August last year, but due to higher price levels value increased from $1,020,450 to $1,-257,000. Declines were recorded in receipts of flax seed, coal-tar dyes, other dyeing and tanning materials, and pyrethrum flowers.

British I.C.I. Adopts Pension Plan for 43,000 Workers

Chilean Nitrate Stages Sharp "Comeback" in '35 — Italian Nitrogen Consortium Formed — German Potash Firms Increased Net Profit in Past Year — Montecatini to Operate Hydrogenation Plant—

Imperial Chemical Industries is initiating a pension plan Jan. 1st which will cover 43,000 manual workers. A plan for foremen and general staff is already in existence. A worker may retire by right at 65, by consent of the company at 60, and the average worker will draw £1 per week after 40 years of service. Company contributes 3% of its current wage costs and the workers contribute 2½% in deductions from wages.

U. S. Takes 50% Chilean Nitrate Sales

British Commercial Secretary at Santiago, Chile, reports '35 nitrate production at 1,135,000 metric tons, sales, 1,275,000. For the two previous years production averaged only about 500,000 tons. In boom times as much as 2,500,000 tons were marketed. U. S. is said to take about 50% of present sales. Profits are up, from £1,294,948 in '34 to £2,153,756.

Foreign Developments Summarized

Highlights of last month's foreign chemical news briefly told: Egypt is attempting to increase beeswax production. During the first half of '36 exports were 122,000 lbs., and the U. S. took 85%, valued at $35,000. Italy is fostering a naval stores industry. Germany's "El-Varnish", substitute for linseed, is not meeting with great success. Rumania is producing carbon black from natural gas in a government-controlled plant. German coke producers made 68,461 metric tons of by-product nitrogen in year ended June 30th, as against 55,507 in the preceding fiscal period and 49,700 in '32-'33.

Ninety synthetic ammonia plants located throughout the world had an annual nitrogen capacity of 2,282,500 tons (metric) in '31. Now 111 plants have a capacity of 2,803,000 tons, the Nitrogen Guild of Tokyo reports.

Mitsubishi is entering the molded plastic field. British Sulfate of Ammonia Federation's headquarters are now at Gas Industries House, 1, Grosvenor Pl., London, S.W.1. A new company jointly owned by the Italian Government and Montecatini has taken out patents from the International Hydrogenation Patents Co. for construction of coal and oil hydrogenation plants which will cost $5,000,-000 and 1½ years to build.

The Italian Nitrogen Consortium has been formed by the two leading producers of synthetic nitrogen fertilizers to handle domestic and export sales. Germany, critically short of glycerine, has decreed that all domestic sales must be approved by the Trade Control Board. Exportation, except in special cases, was prohibited in November, '35.

Egypt is considering a nicotine sulfate plant. Kenya Colony's exports of pyrethrum flowers totalled but 50 long tons in '34, jumped to 206 in '35 and then to 578 in the first half of '36. Production of Australian tea tree oil (said to be 13 times more efficient than carbolic) yet non-toxic, now approximates 5,000 gals., and could, it is said, be increased to 50,000 annually.

Unfavorable Outlook for Kauri

New Zealand's kauri·gum industry is doing poorly. Unsatisfactory results have been obtained in attempts to improve quality by using solvent extraction. U. S. imported 2,625 metric tons of French casein in the first half of '36, as against but 45 tons in the corresponding period of '35. A new plant for the extraction of oiticica with a capacity of 3 tons daily will be ready in January at Quixada, State of Ceara, Brazil.

After declining for several years Germany's exports of synthetic aromatics are increasing. German potash industry increased its average dividend rate to 4.76 from 4.21%. Agreement with Spanish producers and increased domestic sales were the principal reasons. Red lead may no longer be used in Germany to paint gratings, fences, etc. Shortage of lead is the answer. A new rosin ester "Harzester AEJ" of unusual properties is now marketed in Germany. German chemists say the greatest problem confronting them is the development of domestic sources of fatty-acids and glycerine.

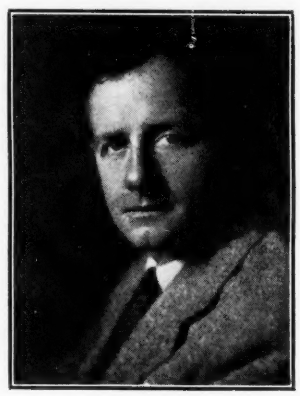
Miner, du Pont, Heads Chemical Safety Section

Frank G. Breyer, Singmaster and Breyer, is Elected President of the Consulting Chemists and Chemical Engineers—International Acetylene Association to Meet Nov. 18-20th—

At the recent meeting of the chemical section of the National Safety Council held at Atlantic City, H. L. Miner of du Pont was elected general chairman. Associated with him in directing the activities for the coming year are: Vice-chairman in charge of program, Ralph L. Rogers, Jr., Tennessee Eastman; vice-chairman in charge of engineering, J. J. B. Fulenwider, Hercules Powder, Parlin, N. J.; secretary, Ralph O. Keefer, Aluminum Co. of America, Pittsburgh, Pa.; news letter editor, F. W. Dennis, Hooker Electrochemical Co., Niagara Falls, N. Y.; membership and publicity committee chairman, C. E. Sevrens, Merrimac Chemical, Boston; occupational disease committee chairman, Dr. Leonard Greenburg, N. Y. State Dept. of Labor; poster committee chairman, E. L. Root, Celluloid Corp., Newark; statistics committee chairman, R. C. Stratton, The Travelers Insurance Co., Hartford, Conn. Members at large are: A. L. Armstrong, Eastman Kodak Co., Rochester; F. E. Clancy, Jr., Mathieson Alkali Works, Niagara Falls; E. F. King, Lever Brothers Co., Cambridge, Mass.; S. D. Kirkpatrick, *Chemical and Metallurgical Engineering*; John Roach, Deputy Commissioner of Labor, Trenton, N. J.; John S. Shaw, Hercules Powder, Wilmington; Plummer Wheeler, American Cyanamid, Linden, N. J.; and S. E. Whiting, Liberty Mutual Insurance Co., Boston.

Breyer Succeeds Wright

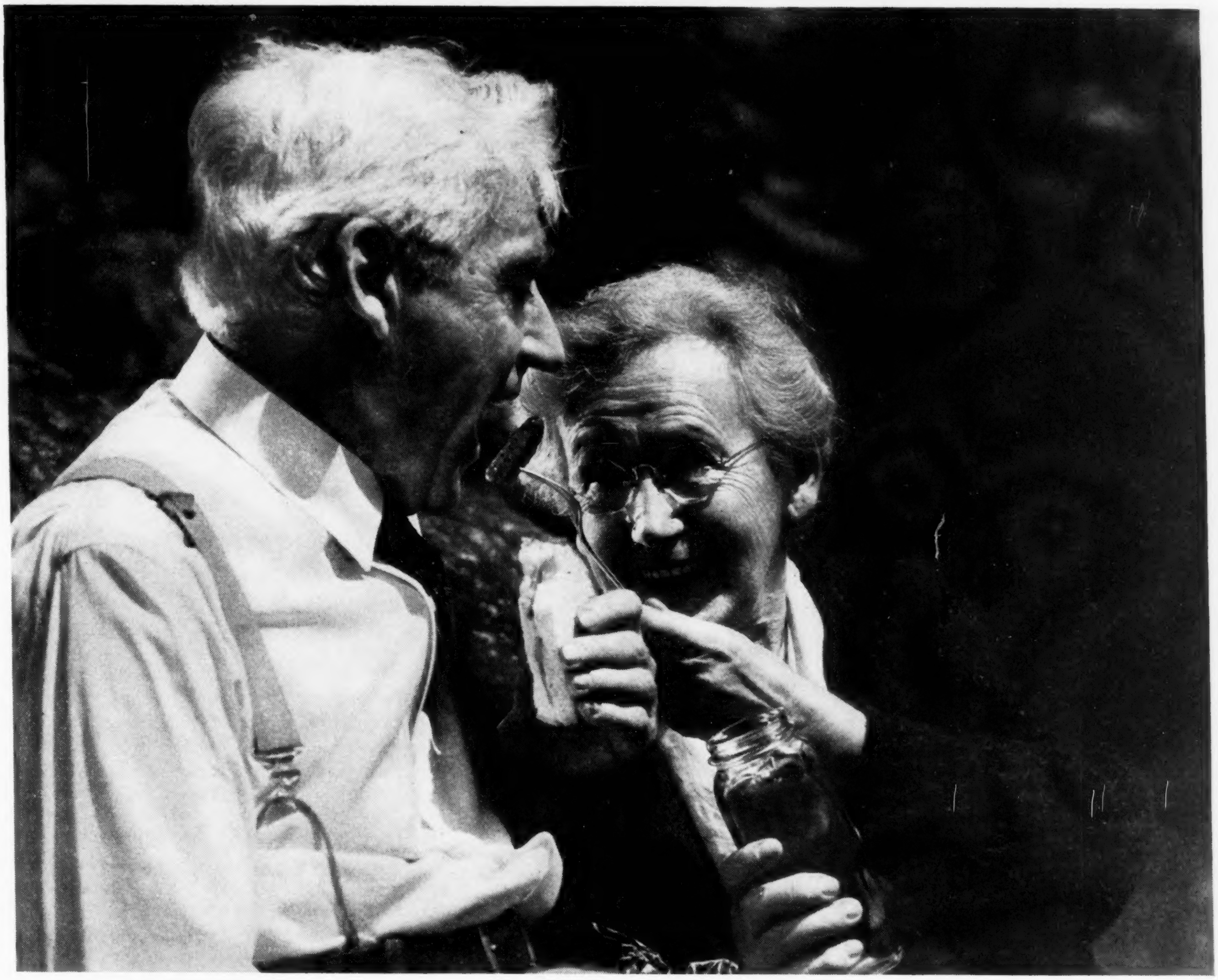
Election of Frank G. Breyer of N. Y. City as president of the Association of Consulting Chemists and Chemical Engineers to succeed Thomas A. Wright of



FRANK G. BREYER

The Consultants Select a Popular Leader.

Lucius Pitkin, Inc., was announced Oct. 28th. Ralph W. Bailey of Stillwell and Gladding, N. Y. City, was chosen vice-president and Bernard L. Oser of the Food Research Laboratories, secretary. Alvin C. Purdy of Bull and Roberts, N. Y. City, was named treasurer.



Gustavus J. Esselen of Boston, William M. Grosvenor, Jr., of N. Y. City, and Preston S. Millar of the Electrical Testing Laboratories, N. Y. City, were elected directors for 3 years. Other directors of the organization are:

George Barsky of Barsky and Strauss, N. Y. City; Prof. Hal T. Beans and Prof. Arthur W. Thomas of Columbia; J. W. E. Harrisson of LaWall and Harrisson, Philadelphia; John P. Hubbell of Singmaster and Breyer, N. Y. City; Louis Weisberg of N. Y. City.

New Atlas Plant Described

J. T. Power of Atlas Powder, and M. G. Kershaw of du Pont's engineering department, were speakers at a dinner meeting of the Philadelphia-Wilmington Section of the A. I. Ch. E. at the Hotel duPont. T. H. Chilton, chairman of the section, was toastmaster. About 70 members and guests attended.

Products to be manufactured at the new Atlas plant, principally Mannitol and Sorbitol, were described by Mr. Power. He also told of the methods and processes of their manufacture.

Summary of New Pa. Laws

Members of the Philadelphia Drug Exchange heard C. William Duncan, interviewer and columnist, at the luncheon meeting held Nov. 11th at the Bellevue-Stratford. The Drug Exchange has prepared a summary of the laws enacted at the last session of the State Legislature which adversely affect business. The Legislative Committee will be glad to provide copies to those interested as long as the supply lasts.

Acetylene Convention, Nov. 18-20th

Outstanding leaders in the welding industry are to appear on the program of the 37th Annual Convention of the International Acetylene Association. Meeting is to be held this year in St. Louis on Nov. 18th, 19th and 20th. Copies of final program can be obtained upon request to the secretary at the office of the Association, at 30 E. 42nd st., N. Y. City.

Personnel

Sheldon, Morse, Hutchins, and Easton, Inc., public relations counsel with a number of clients in the chemical field, is entering the advertising field also. Roland W. Estey, formerly with J. Walter Thompson where he had charge of the Lever Bros. account, has joined the staff of S.M.H.&E. Charles G. Thoma, formerly with Firth-Sterling Steel, is another newcomer to the staff. Clyde Prettyman has been appointed art director.

Others in New Positions

Other appointments reported last month: M. S. Purvis, V.-C. sales manager and vice-president, is now on the board in the place of Joseph A. Dart who has resigned. Those on the executive committee include Alfred Levinger, Spencer L. Carter, and A. Lynn Ivey.

G. Bryant Bachman, formerly at Ohio State University, is now a research chemist for Eastman Kodak; R. W. Borgeson, formerly at Iowa State, is now development director for Fisher Scientific; Dr. Charles Carpenter, at Carnegie "Tech", has accepted position of chief chemist with the Pulp and Paper Laboratory of the Industrial Committee of Savannah of which Dr. Charles H. Herty is the director.

Franklin D. Jones has resigned from Merck and is vice-president of Peacock Laboratories, Philadelphia, a new maker of chemical specialties; E. O. Denzler has joined the staff of Vultex Chemical, Cambridge; E. A. Van Valkenburgh is now with Foster D. Snell, Inc., Brooklyn, as a special consultant on rubber problems; H. L. Fisher, who recently resigned after 10 years service with U. S. Rubber, has now joined the combined research laboratories of Air Reduction and U.S.I.

COMING EVENTS

American Petroleum Institute, Annual Meeting, Stevens, Chicago, Nov. 9-12.
Twelfth Annual Southern Convention, National Fertilizer Association, Biltmore, Atlanta, Nov. 9-11.
National Association Practical Refrigerating Engineers, Stevens, Chicago, Nov. 10-13.
American Institute of Chemical Engineers, Annual Convention, Lord Baltimore Hotel, Baltimore, Md., Nov. 11-13.
Annual Convention, Packaging Machinery Mfrs. Institute, Nov. 11, 12, Edgewater Beach Hotel, Chicago.
Federation of Paint and Varnish Production Clubs, Annual Convention and Paint Show, Drake Hotel, Chicago, Nov. 15-17.
12th Annual Meeting, National Joint Committee on Fertilizer Application, Washington, Nov. 17.
American Society of Agronomy, Annual Meeting, Mayflower, Washington, Nov. 18-20.
International Acetylene Association, 37th Annual Convention, Jefferson Hotel, St. Louis, Mo., Nov. 18-20.
National Paint, Varnish, and Lacquer Association, Annual Convention, Drake Hotel, Chicago, Nov. 18-20.
American Society of Mechanical Engineers, Annual Meeting, N. Y. City, Nov. 30-Dec. 4.
National Exposition of Power and Mechanical Engineering, Grand Central Palace, N. Y. City, Nov. 30-Dec. 5.
Twelfth National Exposition of Power and Mechanical Engineering, Grand Central Palace, N. Y. City, Nov. 30-Dec. 5.
Independent Petroleum Association, Annual Meeting, Biltmore Hotel, Oklahoma City, Okla., Nov. 30-Dec. 1.
American Society of Refrigerating Engineers, 32nd Annual Meeting, Pennsylvania, N. Y. City, Dec. 2-4.
10th Annual Meeting, American Association of Soap and Glycerine Producers, N. Y. City, Dec. 3.
American Association Textile Chemists and Colorists, Annual Meeting, Providence, R. I., Dec. 4-5.
1st International Consumers' Petroleum Exposition, Convention Hall, Detroit, Mich., Dec. 5-13.
National Industrial Council, National Association of Manufacturers, Waldorf, N. Y. City, Dec. 7-8.
National Association of Insecticide & Disinfectant Manufacturers, Penn Athletic Club, Philadelphia, Dec. 7-8.
National Association of Manufacturers, Waldorf, N. Y. City, Dec. 9-10
Seventh National Organic Chemistry Symposium, Richmond, Va., Dec. 28-30.
Third Chemical Engineering Symposium, A. C. S., Columbia University, Dec. 28-29.
National Association of Dyers and Cleaners, 30th Annual Convention, Netherland-Plaza Hotel, Cincinnati, Ohio, probably Jan. 25-28, '37.
Technical Association of the Pulp and Paper Industry, Feb. 22-25.
American Society for Testing Materials, Regional Meeting, Palmer House, Chicago, Mar. 1-5, '37.
American Ceramic Society, Annual Meeting, Waldorf-Astoria, N. Y. City, week of Mar. 21, '37.
12th Southern Textile Exposition, Textile Hall, Greenville, S. C., Apr. 5-10, '37.
American Chemical Society, 93rd Meeting, Chapel Hill, N. C., Apr. 12-15, '37.
International Association for Testing Materials, 2nd International Congress, London, Apr. 19-24, '37. K. Headlam-Morley, 28 Victoria st., London, S. W. 1.
American Society for Testing Materials, 40th Annual Meeting, Waldorf-Astoria, N. Y. City, June 28- July 2, '37.
"Achema VIII," Plant exhibition, in connection with 50th General Meeting of Verein Deutscher Chemiker, Frankfurt, Germany, Sept., 1937.
American Chemical Society, 94th Meeting, Rochester, N. Y., Sept. 6-10, '37.
Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 6-11, '37.

LOCAL TO NEW YORK

Dec. 11. Joint meeting, technical societies, Chemists' Club.

Garvan Calls New Conference

A conference to bring industry, agriculture and labor into closer cooperation for the good of America will be held in Philadelphia, it was announced last month by Francis P. Garvan, president of the Chemical Foundation. Meeting, to be known as "The First National Economic Conference of Agriculture, Industry and Labor," will be Dec. 7th.

Carriers Seek Higher Rates

Acting with almost unprecedented speed, the I. C. C. on Oct. 23rd granted the request of the Class I carriers for permission to effect a revamping of the nation's freight rate structure and announced a reopening of approximately 1,000 prior proceedings for the purpose of rate revisions.

Permission to file tariffs making possible approximately 1,800 reductions in the present freight rates, including emergency surcharges which expire Dec. 31st next, and increases in almost 40 other instances, was requested in a voluminous petition filed on behalf of the carriers by the Association of American Railroads. Case is to be known as "ex parte No. 118".

Chemical, Fertilizer Representation

The fertilizer industry traffic experts and several of the well-known traffic executives connected with companies holding membership in the M. C. A. have taken the necessary steps to fight the requests of the carriers where such requests affect rates on chemical and allied products.

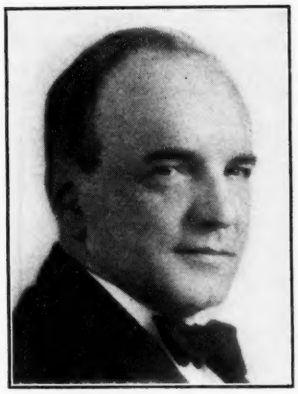
Bausch & Lomb's Fellowship

A broad program of fundamental investigations on the chemistry and physics of glass surfaces to aid in the development of scientific apparatus and ophthalmic instruments has been started at Mellon by Bausch & Lomb Optical.

Whitmore to Receive Nichols Medal

Marston T. Bogert Delivers Principal Address at Dedication of Trinity College's New $500,000 Chemical Laboratory—Landis Attacks Meddling of Politicians in Agricultural Problems—Receives Chemical Industry Medal—

The Nichols Medal of the N. Y. Section of the A. C. S., outstanding distinction in chemical science, has been awarded for '37 to Dean Frank C. Whitmore of the School of Chemistry and Physics of Pennsylvania State College, it has been announced by Dr. Walter S. Landis, chairman of the medal jury. Honor, founded in 1902 to "stimulate original research in chemistry", goes to Dean Whitmore "for his studies in metallo-organic compounds, especially those of mercury, and in the field of aliphatic chemistry, particularly in molecular rearrangements and in the polymerization of olefins", according to the citation. Presentation of the medal will take place at a meeting of the N. Y. Section on March 5, '37.



DEAN FRANK C. WHITMORE

"For studies in metallo-organic compounds."

Fears "Devastating Forces"

Extinction of life on earth by the reckless release of "devastating forces" is a possibility which man must face, Marston Taylor Bogert, professor of organic chemistry at Columbia, declared in an address at the dedication of the new $500,000 chemistry building of Trinity College last month.

PROF. MARSTON T. BOGERT

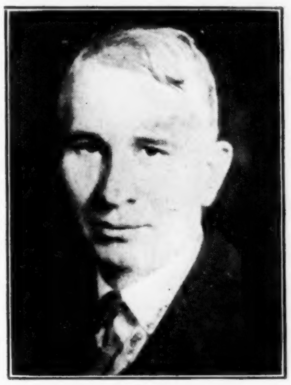
"Better humans must be bred."

To avert this catastrophe, "better humans" must be bred, asserted Prof. Bogert, whose theme was "The Research Chemist, Mankind's Devoted and Indispensable Servant". Scientific research, he held, is no longer merely the price of progress, but the price of existence.

From Farm to Industry

The politician has upset an agricultural balance and brought about a farm problem far more serious than nature has ever inflicted, Dr. Walter S. Landis, Cyanamid vice-president, declared in an address at The Chemists' Club, N. Y. City, on Nov. 6th, when he received the Chemical Industry Medal for '36.

"The muddled handling of this problem, and I speak from the world's standpoint, has actually retarded agricultural progress by blocking the road through which all other forms of business have found the way to prosperity, and in consequence when the customer is injured the supplying industry suffers likewise," charged Dr. Landis, whose theme was "Concentrated Fertilizers."



DR. WALTER S. LANDIS

"Chemists should have a schooling in politics."

"The average chemist has had little experience with politics in his business and knows not the pitfalls that such can present. I should recommend to all chemists a schooling in politics, using as a textbook a history of agricultural chemistry, for the lessons there learned may be very useful, since politics are now beginning to spread over the farm to industry.

"I might almost wish to inscribe a new law in the chemical textbooks, reading somewhat as follows: 'Beware the political uplifter, for a single one can undo the constructive work of a score of the best chemists.' Let us hope we can bar him out of the remainder of our industry."

The Chemistry Industry Medal went to Dr. Landis "for valuable application of research to the chemistry and economics of the fertilizer industries." It was presented by Prof. D. D. Jackson of Columbia as "an annual tribute to distinction in applied chemistry." Dr. M. C. Whitaker, in an address describing the accomplishments of the medalist, characterized Dr. Landis as "a man of extraordinary achievements, who has won uniform success in a large number of highly diversified major undertakings."

Personal Briefs

Carl S. Miner, Miner Research Laboratories, told the Women's Advertising Club of Chicago last month: "Chemical research does not stop with the discovery of new characteristics in old products. It assumes the burden of producing new or improved products designed to form the basis of newer or more potent advertising campaigns."

Allan Brown, Bakelite, is now chairman of the board of the Association of National Advertisers. M. H. Leister, Sun Oil, was elected to the board, and G. C. Congdon, Jones & Laughlin, to a vice-chairmanship.

Dr. Charles L. Reese, president of the Wilmington Society of Fine Arts, is advocating a center with halls for lectures on drama and music. He wants a working institution, not merely a storehouse for pictures.

A. M. Hamann loaned by du Pont to the officials of the city of Niagara Falls to direct its public welfare work has resigned his commissionership and will return to his regular work.

C. L. Gabriel, Commercial Solvents' vice-president, discussed "Fermentation Processes in Industry," before the Baskerville Chemical Association of C.C.N.Y. on Oct. 16th.

The new yacht of Lammot du Pont was launched last month. It was christened *Marmot* by Miss Alexandrine du Pont, daughter of Mr. du Pont, as it slid into the Brandywine River.

George A. LaVallee, president of the Marietta Paint and Color, has been chosen to direct the Marietta, Ohio, Community Service Council Chest drive this year.

H. S. Wherrett, president of Pittsburgh Plate Glass, has been named chairman of the industrial solicitation committee for the Pittsburgh Community Fund campaign.

The "Gangplank"

J. F. Mitchell-Roberts, export manager for Oliver United Filters Inc. has just returned from a 6 months tour of the Far East where he visited many plants using Oliver United filters in the Philippines, Japan, Manchukuo and China.

Edgar Sangier, prominent Belgian industrialist identified with Société Generale des Minerais, Union Minière du Haut-Katanga and other companies affiliated with Société Generale de Belgique, of which he is a director, sailed Oct. 29th in the *Ile de France* after a visit of several weeks in the United States.

Dr. Clement Joseph Guillissen, director of research for Union Chimique Belge sailed last month in the *Normandie* after several weeks of travel throughout the country after attending the A.C.S. Pittsburgh meeting.

E. F. Feely, representative of International Nickel in South America, and J. S. Vanick, a member of the Development and Research Division, are visiting several South American countries within the next few months in order to offer consultation service to industrial executives and engineers on problems involved in the production and application of nickel alloys. Both men are metallurgists and qualified to provide valuable assistance in an advisory capacity.

André Armengaud, prominent French engineer and patent counsel, arrived in the French liner *Ile de France* Oct. 27th with Mme. Armengaud. They will visit Washington and several midwestern cities during a stay of 4 or 5 weeks.

Arriving in New York October 8th aboard the *Conte di Savoia*, F. H. Leonhardt, president of Fritzsche Brothers, completed a European trip begun last June. He was accompanied on his return by his wife and daughter, and by Dr. Ernest S. Guenther, chief of the firm's research division, whom he had previously joined in Southern France.

National Carbon Wins Activated Carbon Suit

Decision Declares Western Shade Cloth Infringed Patents Held by Plaintiff — Wishnick, Tumpeer Enters Activated Carbon Field—R. & H. Chemicals Division of du Pont to Sell Reid Cyanide Generator—Dow Opens Chicago Office—Other Company News—

U. S. patents 1,497,543 and 1,497,544, covering activated vapor-adsorbent carbons and processes of manufacturing them, were again upheld in a decision handed down on Oct. 20th by Judge Barnes, sitting in the District Court for the Northern District of Illinois. The case involved National Carbon, plaintiff, vs. The Western Shade Cloth Co., defendant, and was brought in the interest of Columbia Activated Carbon, which is made by plaintiff and sold by Carbide and Carbon Chemicals Corp. Defendant was alleged to have infringed both patents by its use of activated carbon purchased in '27, and, later, in '33 from the American Solvent Recovery Corp. of Columbus, Ohio.

Trial of the case, which lasted 3 weeks, was concluded on Oct. 10th. During the trial, expert testimony for the plaintiff was given by Prof. A. B. Lamb, of Harvard. Corroborative testimony was given by Col. Bradley Dewey, in charge of the Chemical Warfare Service defense activities during the World War, and Prof. W. K. Lewis, also of the Chemical Warfare Service and now at M. I. T.

Attorneys for the parties presented final arguments on Oct. 20th, and Judge Barnes immediately rendered his decision in favor of plaintiff. Court held the claims of the patents valid and infringed, and ordered the customary injunction and accounting. A similar decision in the case of National Carbon vs. Richards & Co., and The Zapon Co. was affirmed on Aug. 10, '36, by the U. S. Court of Appeals for the 2nd Circuit. In this case also, the patents were held valid, and the defendants were adjudged to have infringed the claims in the use for solvent recovery purposes of a carbon made by The Barnebey-Cheney Engineering Company without license from the patentee.

Now Witco Activated Carbon

Wishnick-Tumpeer, well-known supplier of chemicals, colors and pigments, has announced the addition of activated carbon to the WITCO line. Company, with offices at 295 Madison ave., N. Y. City, and branches in principal centers throughout the country, reports favorable acceptance for its product in the fields of water purification and dry cleaning, to which sales efforts are being directed.

Study of Colloidal Carbon Black

The increasing demand for carbon black, has impelled the directors of Columbian Carbon, N. Y. City, to the decision to devote a whole 4 story brick building in New York to the intensive study of colloidal carbon. This will embrace not only problems in its manufacture but also in its application to rubber, ink, paint, paper, concrete, sulfur, synthetic resin plastics, records, radio resistors, dry and wet batteries, etc.

HCN Generation by New Method

The R. & H. Chemicals Dept., du Pont, has acquired the rights to manufacture and sell the Reid Generator from the Cyanide Generator Co., Tacoma, Wash. The Reid generator is specifically designed for the efficient, economical production of hydrocyanic acid gas from sodium cyanide for fumigation. Through the use of this generator it is now possible to carry out either localized or complete fumigations from outside of the mill or structure, a decided advantage in safety and economy.

No new parts or other equipment are needed. The structure does not have to be piped or otherwise equipped for the introduction and distribution of the fumigating gas. Nobody has to be in the structure at any time during the fumigation.

Snow Brokerage in N. Y. City

The Snow Brokerage, formerly represented in N. Y. City by Snow & Cleaver, is now operating a brokerage firm at 15 William st., under the firm name. N. Y. City branch will be in charge of Joseph Hart with Miss Margaret Weber as a vegetable oil broker.

Bopf-Whittam is Victor

Bopf-Whittam Corp., Westfield, N. J., successfully enjoined the Genuine Chemical Co., Elizabeth, from using processes allegedly developed by the Westfield company for the manufacture and refining of wool fat. Michael P. Gutowski, partner in the defendant firm and a former employee of Bopf-Whittam, denied that he is using the Bopf process and stated that he had devised an entirely new method. Vice Chancellor Buchanan ruled, however, that the Bopf process is an exclusive one and that Gutowski obtained knowledge of the method while employed in a confidential capacity.

Miller's Suit Opens

Preliminary hearings on a $5,000,000 suit brought by C. Wilbur Miller against 14 individuals and companies that he alleges conspired to wreck Davison Chemical were begun last month before Judge Edwin T. Dickerson in the Superior Court, in Baltimore.

Court has been asked by the defendants to squash the suit, which also alleges that a number of interests, among them the House of Rothschild, conspired to "destroy, wreck, ruin and impoverish" Mr. Miller.

Doan Goes to Chicago

Dow Chemical is opening a Chicago sales branch at 135 S. La Salle st. Wilson Doan, the Dow St. Louis sales manager, will take charge at Chicago.

Company Briefs

Nu-Enamel acquires the Cleveland plant of Chi-Enamel Paint & Varnish and will establish national headquarters there.

Sunola Trading Corp., with offices in the Produce Exchange Bldg., is a new factor in the oils and fats distribution field.

Ohio Hydrate & Supply, Woodville, Ohio, is operating a newly discovered deposit of dolomite lime, said to be the purest (99.67%) ever discovered.

Russell-Hale Chemical, Houston distributer of industrial chemicals, purchases the warehouse and property it now occupies and in addition, an acre of ground for future expansion. Two new salesmen have been added to the staff.

Wesson Oil & Snowdrift purchases for $650,000 the plants of the International Vegetable Oil Co. of Memphis.

Maas & Waldstein, Newark lacquer manufacturer, has available for distribution a portfolio which demonstrates the value of paper lacquer for protecting and enhancing the beauty of fine color work.

The Bristol Co., Waterbury, Conn., manufacturer of control equipment, adds 4 graduate engineers to its field service department.

Lake Erie Chemical, maker of tear gas bombs, takes a lease on a plant at 2188 Scranton Rd., Cleveland.

A Canadian paper company has taken out a charter to establish a plant at Cornwall, Ont., to manufacture vanillin from sulfite liquor. Plant will be relatively small and will be expanded when demand warrants.

Anderson-Prichard Oil's sales staff attended a 3-day meeting in Chicago late in September.

Thompson-Hayward Chemical is negotiating for the purchase of the building it now leases in Omaha.

Kentucky Color & Chemical appoints Paul W. Wood & Co. in place of E. S. Browning as its San Francisco representative.

N. J. Zinc conducted the best trade paper campaign in the past year, according to an award made at the annual conference of National Industrial Advertisers Association.

Sales of Tennessee rock by both Hoover & Mason Phosphate and Ruhm Phosphate & Chemical have increased substantially this year, according to reports.

Walter Kidde & Co. demonstrated the Lux "Dry Ice" method of fire fighting on Oct. 8th at Bloomfield, N. J., before a large delegation of plant officials.

Colors & Chemicals, Inc., is the name of a new concern located at Macomb, Ill., which will make special dyes and colors for ceramics, inks, cement, etc.

Federal Chemical has taken an option on a large phosphate tract near Columbia, Tenn.

Apothecaries Hall is now a distributer of Mathieson Alkali's HTH.

Foster D. Snell, Inc., chemical consultants located in Brooklyn, is opening a branch at 215 N. Calvert st., Baltimore. For the present the branch will be under the direction of Theodore M. Miller.

Continental Chemical, water treatment, located at Tulsa, is expanding its activities.

With the Equipment Companies

Alsop Engineering moves to a new factory in Milldale, Conn., but will retain its N. Y. City offices, showrooms, and a service department at 17 W. 60th st. Company makes mixers, filters, filling equipment of all kinds, labelers, and glass-lined tanks of every description.

Leeds & Northrup, control instruments, is opening a Hartford office at 75 Pearl st.

Paterson Foundry & Machine, East Liverpool, Ohio, has just released a very detailed report on processing kettles as used for the manufacture of synthetic resins and varnish and in the chemical and food industries by W. Mynard McConnell, chief chemical engineer of the company. The report is a valuable and important document which should be in the hands of the general manager, superintendent, chief engineer and chief chemist of every chemical and chemical processing plant. Copies are available directly from the company.

New Chemical Companies

Among the new companies incorporated last month were: Macco Products, 525 W. 76th st., Chicago, industrial chemicals; Marshall Chemical, 134 N. LaSalle st., Chicago, to deal in industrial chemicals; Eastern Chemical & Manufacturing, Jersey City.

October Industrial Chemical Tonnages at Year's Peak

Approach of the National Election Failed to Exert an Unfavorable Influence on Purchasing—Contract Prices Expected Early in November—Sharp Decline in Yellow Prussiate—Bicarb Reduced—Texas Raises Sulfur Tax—

October industrial chemical consumption was extremely heavy despite a slight hesitancy which developed in the final week caused by the uncertainties of the national election. Chemical producers have held back announcements of '37 contract prices for two reasons, first, the election and second, the Patman Act. Next year's prices, however, are expected in the second week of November and probably the alkali schedule will be the first to be released.

In the price revisions of the month the two outstanding ones were a 1½¢ decline in yellow prussiate of soda and a 10¢ reduction in the carlot quotation for "bicarb." Foreign competition has featured the yellow prussiate market for several months, imports from Japan having totalled 1,116,885 lbs. in the first 7 months of this year. One of the largest U. S. producers is said to be retaliating by exporting into the Japanese market 30 to 40 tons a month.

The volume of chemical consumption in the 6 weeks preceding the presidential election was very unusual and contrary to the usual trend. Practically every large consuming industry was operating at high levels. For example, in the glass field the *American Glass Review* reports that delayed shipments will likely be the rule for the balance of '36. Further delays may also result from the action of 6,000 workers in the 6 plants of Pittsburgh Plate Glass who went out on strike on Oct. 25th. Soap manufacturers generally are busy and P. & G. officials report that they will be forced to operate plants above "normal" capacity. Tanning operations and production of newsprint and other forms of paper were in excellent volume and the sharp rise in automotive activity on the '37 models brought about important increases in the consumption of electroplating chemicals, lacquers, and solvents. The rubber centers reflected the demand for tires by the automobile producers. All indications seem to point to a continuance of the present satisfactory demand for chemicals in the final quarter. A firm price structure for '37 is anticipated in all directions.

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Copper metal	$0.10¼	$0.09¾
Fluorspar, 96-98%	31.00	30.00
Sodium stannate	.31	.28½
Tin metal	.46⅛	.45
Tin crystals	.35½	.35
Tin tetrachloride	.23¾	.23¼
DECLINED		
Acid phosphoric, 85%	$0.13	$0.14
Antimony	.11¾	.12½
Sodium bicarbonate	1.75	1.85
Sodium prussiate	.10	.11⅛
Sodium silicofluoride	.06½	.07

Texas Increases Sulfur Tax

The Texas legislature late last month increased the state tax from 75c a ton to $1.03. This is somewhat below the proposed tax of $2.00 but represents a 37½% increase. A detailed review of the present situation in sulfur was given in C. I., October, '36, p409.

U. S. Sulfur '35 Statistics

U. S. '35 sulfur production amounted to 1,632,590 long tons, a gain of 15% over the 1,421,473 tons produced in '34. Shipments increased slightly from 1,613,838 tons, valued at about $28,900,000 in '34 to 1,634,990 tons, valued at about $29,300,000 in '35. Quantity in stock at the mines on Dec. 31, '34, 3,100,000 tons, was unchanged at the close of '35. Production was reported from California, Louisiana, Texas, and Utah.

Texas '35 output was 1,253,814 long tons, or 77% of the country's total. These figures compare with a production of 1,187,233 tons in '34. Production was made on 2 new leases on Boling Dome, Wharton County, in '35 by Duval Texas

Sulphur and by Baker & Williams. Other properties that contributed to the production in '35 were those of Duval Texas Sulphur at Palangana Dome, Benavides, Duval County; Freeport Sulphur at Bryan Mound and at Hoskins Mound, Freeport, Brazoria County; and Texas Gulf Sulphur at Long Point Dome, Long Point, Ft. Bend County, and at Boling Dome, Newgulf, Wharton County.

Louisiana increased its production 62% with an output of 373,283 long tons compared with 229,830 tons in '34. Shipments, however, decreased from 307,186 tons in '34 to 275,747 tons in '35. As in '34, Freeport Sulphur and Jefferson Lake Oil were the producers. California and Utah production amounted to 5,493 long tons. The Bureau of Mines is not at liberty to publish these figures separately. In '34 California produced 4,410 long tons. No production was reported for Utah in '34.

Imports of 1,763 long tons of sulfur ore were recorded, compared with 5,839 long tons in '34. Chile supplied all sulfur ore received in '34 and in '35.

Exports of sulfur or brimstone totaled 402,383 long tons compared with 507,115 tons in '34, a decrease of 21%. Important quantities of American sulfur were exported to the following countries in '35; Canada received 119,554 tons in '35 compared with 145,384 tons in '34; United Kingdom, 56,252 tons compared with 63,734 tons; Australia, 46,348 tons compared with 44,819 tons; France, 45,455 tons compared with 71,829 tons; and Germany, 42,839 tons compared with 38,819 tons. Exports of crushed, ground, refined, sublimed, and flowers of sulfur in '35 were 24,452,269 lbs., an increase over the 22,651,880 exported in '34. Principal importing countries were Canada with 5,125,627 lbs.; United Kingdom, 2,698,488 lbs.; Australia, 2,554,743 lbs.; Mexico, 1,805,887 lbs., and Germany, 1,787,214 lbs.

CO_2 Trade Practice Conference

Application for a trade practice conference for the carbon dioxide industry has been filed with the Federal Trade Commission by the Carbon Dioxide Institute, with offices at 75 E. 45th st., N. Y. City.

The executive committee of the institute recently adopted a resolution directing the president of the organization to make application to the Federal Trade Commission "for the authorization of a trade practice conference of the carbon dioxide industry, and to cooperate with the Federal Trade Commission on behalf of this institute to promote the success of such trade practice conference."

Rumors of Break in Mercury Cartel Denied

Two Shipments of Metal Leave Spain But Fail to Arrive Here—Italian Shipments Increasing—Glycerine Prices Again Go Higher—Stocks at Low Point—Iodine Situation Reviewed

Mercury supplied most of the news in the fine chemical markets last month. The trade here became quite excited when reports arrived announcing that two ships with a total cargo of 3,000 flasks had left war-ridden Spain. For a week or 10 days the whereabouts of the two steamers were shrouded in mystery. Finally one turned up in Havana and tales of mutiny were given to the press. The other ship still remains unaccounted for.

Rumors that a break-up of the Italo-Spanish mercury cartel is imminent are not given much credence in this country. With the Spanish rebels apparently in the ascendency, a closer alliance between the two countries would seem more probable for it is generally understood that Fascist Italy is highly sympathetic with the Fascist Spanish rebellion. Shipments of mercury are coming out of Italy now quite regularly, and the shortage in the U. S. is not quite as alarming as it was two months ago.

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Camphor slabs	$0.52	$0.50
Powd.	.52	.4940
Glycerine, soap lye	.16	.14
Saponification	.17½	.16
Dynamite	.21½	.17½
C. P.	.21½	.17½
Mercury	92.00	90.00
Mercury iodide, yellow	3.65	3.55
Red	3.55	3.45
Zinc stearate, U.S.P.	.21	.20
DECLINED		
Camphor, syn., dom.	$0.48	$0.48¼
Corn sugar, 42°	3.80	3.95
43°	3.90	4.05
Mannitol	1.48	1.60
Platinum	45.00	64.00

Glycerine Imports Increasing

Glycerine prices again are moving upwards. Since the beginning of the current year the domestic glycerine market has been characterized by lessening stocks and rising prices accompanied by much heavier imports of both crude and refined during recent months. Factory and warehouse stocks of all grades of glycerine totalled 29 million lbs. on June 30th of this year, according to the Bureau of the Census, compared with 37 million at the beginning of the year and 43 million on June 30, '35. All grades have shared in the decline.

Production continued at high levels during the first half of the year, total output reaching 128,400,000 lbs. but was somewhat below the record for the first 6 months of '35 when 140,000,000 lbs. were produced. The production decline was general with all grades—output of crude (80% basis), decreasing from 75½ to 70 million lbs., dynamite grade from 25 to 22 million lbs., and chemically pure from 40 to 37 million lbs.

While the U. S. has not as yet attained self-sufficiency insofar as its glycerine requirements are concerned it has nevertheless greatly reduced its dependence upon foreign sources, notwithstanding our rapidly mounting consumption. Prior to the World War our glycerine imports ranged from 30 to 40 million lbs. In '35 imports were comparatively light—only 8,200,000 lbs. of crude and 68,500 lbs. of refined being brought in from foreign countries. Receipts continued light during the first half of the current year but in August a total of 1,663,500 lbs. of crude and 621,000 lbs. of refined were imported bringing the total for the first 8 months of the year to 5,413,000 and 833,250 respectively.

U. S. 2nd Producer of Iodine

World production and trade in iodine has undergone many changes in recent years with the U. S., formerly dependent upon a foreign monopoly for its supplies, emerging as the world's second largest producer, and capable of obtaining its entire requirement from domestic sources.

Prior to 1932 little iodine was produced in the U. S. During the World War small quantities were extracted from seaweed at plants on the Pacific Coast which are no longer active. In 1932, however, after years of experimental work, several companies in California and one in Louisiana began the recovery of iodine on a commercial scale from brines and oil well waters. The Louisiana project which used salt brine as a base material was later abandoned.

U. S. production during '35 based on sales by producers amounted to 245,700 lbs., according to the Bureau of Mines, and has averaged 276,500 lbs. per annum during the past 4 years—output in '33 running as high as 401,500 lbs.

Imports of crude iodine, chiefly from Chile where it is produced as a by-product of the nitrate industry, amounted to 376,000 lbs. in '35, compared with 1,479,000 lbs. during the preceding year, and an annual average of 836,000 lbs. during the past 5 years. Further marked declines have occurred during the current year, receipts during the first 7 months amounting to only 50,000 lbs.

Many countries throughout the world produce iodine from seaweed, though the output from this source has declined materially in recent years. Japan is the world's largest producer of seaweed iodine. A review of the situation in iodine was given in C. I., September, '36, p306.

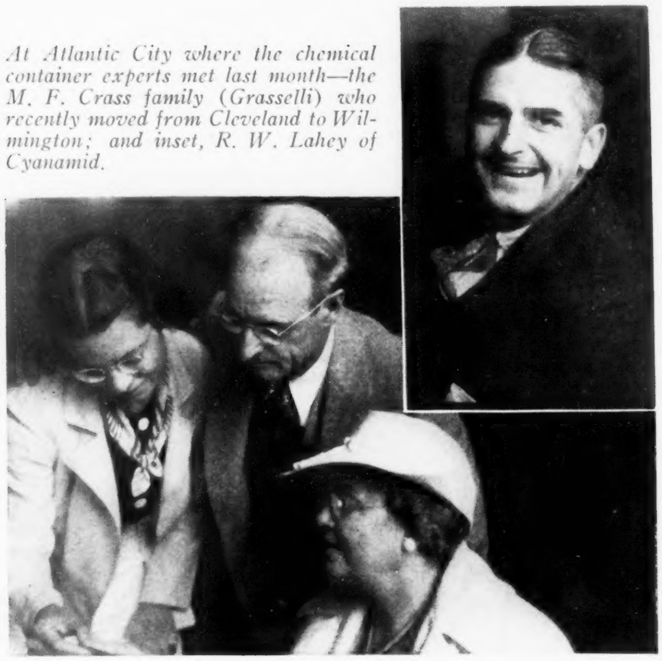
CHEMICAL

The Photographic Record

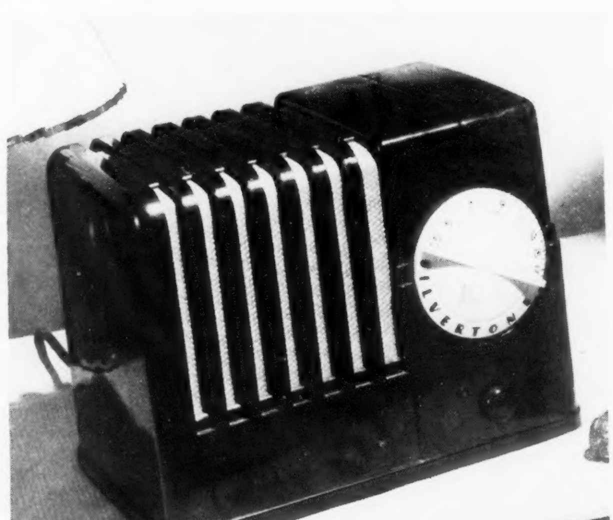
Believe it or not! T. P. Callahan and T. P. Callahan of Monsanto, both in the traffic department; one at Everett, and one at Saint Louis. Both claim no relationship to the other.

William S. Gray, Jr., president, Central Hanover Bank and Trust Co., son of the Chairman of the Board of Wm. S. Gray & Co., and he, himself, president of this well known firm of chemical distributors, has been honored by election to the important post of Chairman of the Clearing House Committee of the N. Y. Clearing House.

At Atlantic City where the chemical container experts met last month—the M. F. Crass family (Grasselli) who recently moved from Cleveland to Wilmington; and inset, R. W. Lahey of Cyanamid.



New office building of du Pont in Wilmington, to be opened February 1, 1937.

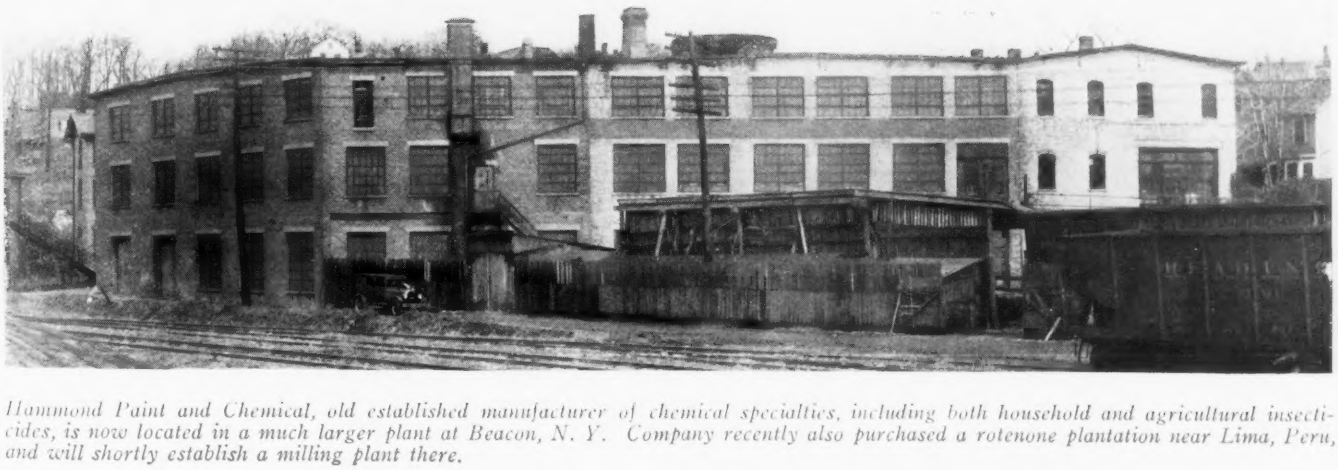


The inherent beauty of molded plastics as well as their utility value is strikingly illustrated by the Silvertone Radio, merchandised by Sears, Roebuck, which won first prize in the Decorative Group, in the competition sponsored by "Modern Plastics." Cabinet is molded of Black Durez, made by General Plastics, and Chicago Molded Products, Inc., were the molders.

NEWS REEL

of Our Chemical Activities

Upper right, New York's first glass building to be erected by Corning Glass Works, on Fifth Avenue, for its Metropolitan headquarters and Steuben Glass display. Walls will be composed of glass construction units as shown below where the workmen are laying up a course of these units. A wall of these units could be built 600 ft. high without giving way under its own weight.

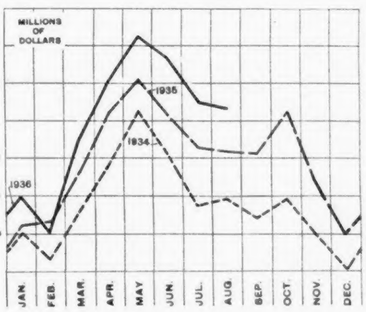


Hammond Paint and Chemical, old established manufacturer of chemical specialties, including both household and agricultural insecticides, is now located in a much larger plant at Beacon, N. Y. Company recently also purchased a rotenone plantation near Lima, Peru, and will shortly establish a milling plant there.

Titanium Pigments Down ¼¢; Lead Pigments Advanced

Rise in Metallic Lead Forces First Price Revision in Lead Pigments Since Last February—Stearates Quoted 1c Higher—Lacquer Demand from Automotive Field Improving—Building Activity Expands—Paint Sales Top '35 Figures—

Paint manufacturers were treated to a pleasant surprise late in the past month when the entire price schedule for titanium pigments was revised downward and new



Paint sales continue to run ahead of '35. Chart by the Bureau of the Census.

quantity prices were instituted on orders for more than 1,000 lbs. or over for the barium and calcium compounds. The productive capacity for the manufacture of titanium pigments has been greatly expanded in the past year and the present reduction is partly due to competition and partly to a desire on the part of the producers to widen the use of titanium pigments.

Not quite so welcome was the upward revision in lead pigments, the first price change since last February. The move, however, had been anticipated for several weeks for the statistical picture of lead was steadily improving. The advances made were one-fifth of a cent in the carlot price for litharge and red lead, ¼c for l.c.l. quantities; and ¼c in orange mineral. No change was made in white lead, but the market strengthened considerably as a result of the higher prices for the other lead pigments. In some

Important Price Changes

ADVANCED

	Oct. 31	Sept. 30
Aluminum stearate	\$0.19	\$0.18
Calcium stearate	.19	.18
Copper oxide	.14¾	.14½
Litharge	.0630	.0610
Magnesium stearate	.21	.20
Orange mineral	.10¼	.10
Red lead, 1/5c in carlots; l.c.l., ¼c.		
Vermillion	1.75	1.65
Zinc stearate	.20	.19

DECLINED

Casein, 20-30	\$0.17	\$0.17½
80-100	.17¼	.18
Talc, Italian	60.00	70.00
Titanium dioxide ¼ to ½c.		
Barium, calcium bases ¼c.		

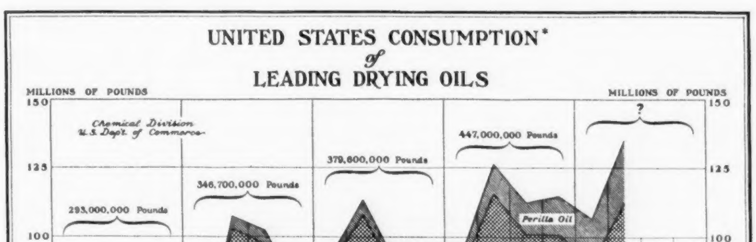
quarters the opinion was expressed that additional increases will shortly be made in metallic lead quotations.

Stearate producers announced a 1c increase. An advance had been expected due to the increased quotations on stearic acid placed in effect in September.

Effect of Foreign Devaluation

Devaluation of the lira and the franc was expected to result in lower quotations on imported siennas, earth pigments, etc., but with the exception of a \$10 decline in Italian talc no definite price reductions were reported. In some cases the foreign suppliers offset the effect of devaluation by increasing quotations, but mainly conditions were so unsettled that American importers have not as yet had time to ascertain the correct situation.

Withdrawals of paint raw materials showed a noticeable decline in the final week of the month indicating that the peak of the fall business has passed. Most producers and marketers of raw materials, however, express great satisfaction over the total tonnage.



Lacquer manufacturers have speeded up production schedules to keep pace with the improvement in the automotive field. Due to the Ford delay in getting started on new models, October production fell some 50,000 units under the corresponding month of last year, but the November total is expected to run materially over the 408,000 units made in November of last year. Fourth quarter production is expected to run between 10 and 20% above the last three months of '35. Factory shipments of the Automobile Manufacturers' Association (Ford is not a member) have produced 2,561,905 units in the first 9 months, a figure 26% above last year and 72% above the 5-year average. Unless some unexpected developments occur production is likely to average about 400,000 units for several months, or through the Winter and early Spring.

Building Recovery is Here

The much needed recovery in residential building, believed by observers as necessary to support the wide gains in business generally, is here. For the first 9 months this class of construction totaled 23% more than was reported for the entire year 1935. The full year 1936 promises to reach a volume three times the size shown for either 1933 or 1934 the low-points of the depression.

In reporting on these conditions the F. W. Dodge Corp. indicated that the volume of residential building in the 37 eastern states during the first 9 months of '36 amounted to \$588,030,600 as against only \$338,907,500 for the corresponding 9 months of '35, making a gain of 73%. For September 1936 alone the residential total was \$80,669,800 as compared with only \$41,810,800 for September, '35 and \$100,522,500 for August of this year.

Total construction work of all kinds started in the 37 eastern states during September amounted to \$234,270,500 as against \$275,281,400 for August and only \$167,376,200 for September last year. (A reduction in the volume of publicly-financed construction largely accounted for the shrinkage between August and September of this year.)

Paint Sales at Satisfactory Levels

Paint sales currently exceed the '35 level by a wider margin than were reported earlier in the year, and manufacturers predict that the improvement will continue for the balance of the year. Sales in the smaller communities are better than in the larger cities. Renovations are heavier in the smaller cities and the bulk of the sales in the big cities is in new residential construction. Paint manufacturers attending the convention scheduled for Nov. 18-20th at the Drake in Chicago will probably set a record for attendance and enthusiasm. Reservations at the Drake are exhausted and the overflow will go to the Knickerbocker.

Heavy Consumption of Textile, Tanning Chemicals

All Divisions of the Textile Field Operating at Satisfactory Levels—Rayon Shortage Feared—Record Shoe Production Forecast—Sulfonated Olive Oils Advanced 2c—Starch and Dextrin Quoted Lower—

A heavy volume of chemicals and specialties moved into consuming channels in the textile and tanning fields in October although some tapering off was reported just prior to the election. Activity in textiles presents a bright picture, particularly so in cotton production. Mills operated at 125.8% of capacity on a single shift basis in September, compared with 115.8 in August of this year, and 93.9% in September of last year. The high point was 128.9% in June of '33. U. S. cotton consumption in September reached 629,727 bales, as against only 450,647 in September of last year. During September, 23,514,270 cotton spindles were active against 22,681,776 in the like month a year ago.

Estimates of October silk consumption run between 44,600 and 48,500 bales with an average of 46,500 bales. This would compare with 45,709 bales consumed in September but would be lower than the 48,000 used in October of last year. *The Commercial Bulletin,* Boston, reports a better demand for wool and higher prices in the piece-goods markets. Raw wool consumption in September shows a weekly average of 5,369,000 lbs. scoured basis in the apparel class, compared with 5,751,000 in August; in the carpet class the September weekly average was 2,290,000 lbs. scoured basis, compared with 2,156,000 lbs. in August.

Outlook for rayon is said to be excellent. Demand for viscose yarn deliveries is extremely heavy. Only 50 to 60% were allotted on December contracts by leading manufacturers. Stocks of non-acetate yarn held by the producers at the end of September was reported to be but 0.3 months' supply. Demand for acetate yarns has been heavy since the recent price cut and the current advance in silk prices is stimulating demand for both non-acetate and acetate yarns.

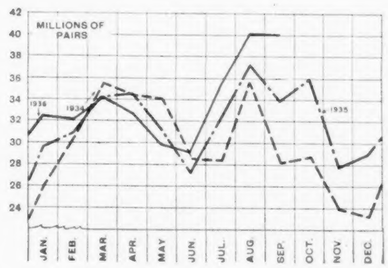
The National Association of Hosiery Manufacturers report that August shipments totalled 11,155,905 dozen pairs, or a 19.7% increase over July and an increase of 15.2% over August of last year. Shipments for the first 8 months of the year are ahead by 10.1% over the corresponding period of last year.

Important Price Changes

ADVANCED	Oct. 31	Sept. 30
Egg yolk	$0.51	$0.50
Oil sulfonated olive, dms.:		
50%	.11	.09
75%	.14½	.12½
80%	.15½	.13½
Quebracho, liq., tks.	.02⅞	.02⅝
Bbls.	.03¾	.03½
Solid	.03⅞	.03⅝
Clarified	.04⅜	.03⅞
DECLINED		
Corn sugar, tanners	$3.78	$4.03
Dextrin, corn	4.35	4.85
British gum	4.60	5.20
White	4.30	4.80
Mangrove bark	25.50	26.00
Sumac, grd.	54.00	60.00
Starch, pearl	3.80	4.04
Powd.	3.90	4.16
Valonia beards	46.00	52.00

Tanners Increase Production

Tanning operations are in good volume. Leather workers in Massachusetts are seeking a new agreement, effective Jan. 1st, which will provide a 20% wage increase and no employment of women in tanneries. Production of shoes in September totalled 40,097,430 pairs, compared with 40,224,883 pairs in August



Shoe production will make an all-time record in '36. Chart by Bureau of the Census.

and 33,909,182 pairs in September of '35. Production during the first 9 months totalled 305,754,581 pairs, an increase of 5% over the same period of '35.

Outstanding price change in chemicals last month was a 2c upward revision in sulfonated olive oil. Higher raw material costs were the cause. Other sulfonated oils were unchanged, but the price structure appeared to be much firmer. Lower corn prices resulted in declines in starch and dextrin and other corn derivatives. Increased production costs were also held responsible for an advance in egg yolk. Quebracho quotations were increased on Oct. 1st. Many consumers were said to have bought heavily in advance of the rise. Few indications have yet been given on '37 contract prices of the more important textile and tanning chemicals. Bichromates are firm. It may be several weeks yet before the schedule is released.

Coronation to Help Dye Sales

Considerable impetus is expected to be given to dye production, particularly the more brilliant shades, by the English coronation next May. Already a number of domestic dye producers have released "Coronation Shades."

Battelle Expands Laboratories

Battelle Memorial Institute, Columbus, Ohio, announces the construction of a new building. Activities of the Institute since its beginning in '29 have steadily expanded and this growth has necessitated the additional space. Construction was started on Oct. 5th. New laboratory, which will adjoin the present building will house the Divisions of Process Metallurgy, Ore Dressing and Coal Preparation.

Basic Conditions in Coal-Tar Chemicals Unchanged

Shortage in Cresylic, Toluol, Xylol, and Solvent Naphtha Continues—Refined Naphthalene Schedule for '37 Released—September Coke Production Shows Increase—

Basic conditions in the coal-tar chemicals changed but slightly in the past month. Movement into consuming channels was highly satisfactory, reflecting the activity prevailing in the textile, tanning, fur, resin, and other fields. The shortages in cresylic, toluol, xylol, and solvent naphtha continued. The release of contract prices for the coming year was held up pending the outcome of the election and the formulation of price policies to operate under the provisions of the Robinson-Patman legislation.

The '37 prices to wholesalers and jobbers for flake and ball naphthalene were announced as unchanged from the current quotations with but one exception, a fractional reduction in the 12-oz. package size. Refined naphthalene, including chipped, crushed, and rice, was reduced ¼c.

Important Price Changes

ADVANCED	Oct. 31	Sept. 30
Creosote oil, No. 2	$0.113	$0.109
DECLINED		
Naphthalene, household, 12 oz. pkgs.	$0.06¼	$0.06½
Industrial, chipped	.06¼	.06½
Rice	.07¼	.07½

Coke production continued its upward trend in September. Daily rate of output from byproduct and beehive ovens, amounting to 133,996 tons, was 3.4% greater than the August rate of 129,618 tons, and was 38.4% above the rate prevailing in September a year ago. Output of byproduct coke for the 30 days of September was 3,831,241 tons, an average per day of 127,708 tons. Compared with the August rate of 124,703 tons, there was an increase of 2.4%, shared almost equally by furnace and merchant plants.

Production of beehive coke increased sharply, from 127,800 tons in August to 163,500 tons in September, a gain of 27.9%. The September daily rate of 6,288 tons was the highest on record since December, 1930.

Stocks at byproduct plants continued to rise, the total on hand at the end of September amounting to 2,033,611 tons, or 2.4% in excess of August reserves. Compared with the same period of '35, however, total stocks show a decrease of 35.0%. Increase in September was entirely at merchant plants, where stocks advanced 5.1%. Reserves at furnace plants were depleted by 2.9%.

Coking coal charged in by-product ovens in September totalled 5,498,672 tons against 5,547,704 tons in August and 4,082,792 tons in September a year ago. Total for the first 9 months was 46,079,652 tons, against 35,744,658 tons in the same period a year ago. Ammonia, representing the ammonium sulfate equivalent of all forms, production in September was 61,256 tons, against 62,047 tons in August and 44,738 tons in September a year ago. Total for the first 9 months was 510,131 tons, compared with 381,873 tons. Recovery of tar for September was estimated at 50,597,755 gals., compared with 50,149,830 in August and 37,633,231 in September last year. Total for the first 9 months was 425,818,391 gals., against 328,565,746 in the same period a year ago. Light oil output was estimated at 15,946,148 gals., against 16,088,341 in August and 11,839,096 in September a year ago. Total for the first 9 months was 133,627,394 gals., as against 103,660,-508 in the corresponding period a year ago.

Appeal on Carbon Black Ruling

The Supreme Court agreed on Oct. 26th to review the decision of a lower Federal court holding constitutional a Texas gas conservation law restricting the manufacture of carbon black. Law prevents carbon black manufacturers in the Panhandle field from using sweet gas as a raw material and requires the use of sour gas. Sweet gas is suitable for household use, whereas sour gas is not, but it is declared that sour gas is suitable for carbon black production. Texas law was attacked on several points but was held valid. Appeal was brought by the Henderson Co. and Portland Gasoline.

Turner Moves Main Office

Main office of Joseph Turner & Co., has been moved to Ridgefield, N. J., where a 2-story structure has just been completed. Office at 500 5th ave., N. Y. City, will be maintained as a branch, under the direction of Charles M. Hollwedel.

Raw Fertilizer Materials Markets Slow

Industry to Hold Important Sessions at Atlanta, Nov. 9-11th—Fall Fertilizer Sales Set Record—August Exports Down—Superphosphate Production Increasing—Organic Ammoniates Decline—

Bookings of raw fertilizer materials were few and far between in the past month. A few mixers have started operations for the Spring trade but, generally speaking, the industry is in the "in-between" season and very little activity can be reported. Price changes were few last month. The organic ammoniates, with the exception of nitrogenous material, continued to decline. A slightly firmer tone was reported from the Baltimore fish scrap market.

The upward trend in fertilizer tax tag sales which had been evident in recent months continued in September. Totalling 257,775 tons in the 17 reporting states, September tax tag sales were the largest on record for the month, exceeding September 1935 by 51%. Sales in the first 3 months of the current fiscal year, from July through September, amounted to 470,000 tons as against 299,000 tons in the corresponding period of last year; in the July-September quarter of 1932, at the bottom of the depression, sales were only 190,000 tons. In recent years sales in this quarter accounted for only 6.6% of the total annual sales.

Important Price Changes

ADVANCED	Oct. 31	Sept. 30
Fish scrap	$3.35	$3.25
Nitrogenous mat., East	2.85	2.75
DECLINED		
Blood, dried, N. Y.	$3.75	$4.20
Chicago	3.75	4.20
Bone meal, 3 & 50, imp.	24.75	25.00
Hoof meal, Chgo.	2.75	2.80
Nitrogenous mat., imp.	2.75	2.85
Sardine meal, Jap.	39.50	40.00
Tankage, grd., N. Y.	3.75	4.00

Imports continued at a high level in August, with tonnage 85% greater than in August '35 and 33% greater than in August '34. Most kinds of materials were imported in larger quantity this year than last. January-August imports were 10% larger in tonnage and 14% larger in value this year than last. A decline in potash imports has been more than offset by larger imports of nitrogenous materials.

Rise In Farm Income

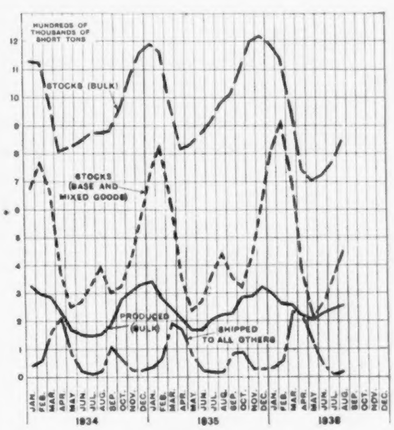
A continued rise in farm income combined with the effects of the soil conservation program probably accounts in part for the rise in fertilizer sales. Another factor favoring increased fertilizer consumption is the relatively low level of prices now prevailing. According to the Dept. of Agriculture, the index number of prices paid by farmers for fertilizer on Sept. 15th was 96% of the pre-war average, the same as it was 4 years ago. In contrast to this, prices received by farmers rose 88% in the 4 years from Sept. 15, '32 to Sept. 15, '36.

August Export, Import Figures

August exports of fertilizer and fertilizer materials were smaller than in August '35, representing a reversal of the trend which had prevailed in recent months. Exports of nitrogenous materials were at an unusually low level. Potash exports continued to rise. For the January-August period exports exceeded the corresponding period of '35 by 39% in tonnage and 61% in value. Increases this year to date over '35 have been particularly marked in nitrogenous materials and potash. This year potash exports have been 33% as large as potash imports; in '35 the ratio was 15%; in 1934 it was 7%.

Continued Rise In Superphosphate

The rise in superphosphate production which had been evident for several months continued in September. Production exceeded September '35 by 36%, with both areas reporting substantial increases. For the first 9 months of this year production in the plants regularly surveyed by the N.F.A. was 12% larger than in the corresponding period of '35.



Vital statistics, production, shipments, and stocks of superphosphate. Chart by Bureau of Census.

Every class of shipments in September showed an increase over September of last year. Shipments to consumers by the reporting establishments last month of 101,500 tons were the largest for the month in at least 6 years and were 62% larger than last year. This sharp rise probably reflects in part the effect of the soil conservation program. Increase in the consumption of mixed fertilizer this

fall is indicated by the rise in shipments of superphosphate in base and mixed goods in the northern area.

Two Important Topics Listed

The interest of the fertilizer industry centers at the moment in the coming Atlanta convention, scheduled for Nov. 9 to the 11th. The effect of the Robinson-Patman legislation on the industry and the details of the self-government plan are the two chief topics scheduled for discussion.

Oils and Fats

The oils and fats markets were featured last month by the sharp rise in coconut oil. At 7¼c the advance over the prevailing price just 3 months ago represents an increase of 65%. Copra prices are up about 50% in the same period and crushers have been experiencing considerable difficulty in obtaining material. Many importers and crushers withdrew temporarily from the market last month, fearing to make further commitments. The cause is said to be the heavy purchasing of Philippine copra by European countries.

It is said that there is a strong possibility of higher linseed prices. Reporting on the situation recently, Archer-Daniels-Midland stated: "Linseed oil today is selling considerably below cost of production and it seems to be a question of just how long crushers will be willing to accept business on this basis. Any increased demand for oil in this country, any improvement in vegetable oil prices abroad or any report of damage to the Argentine crop would immediately be reflected in higher quotations of linseed oil here."

Flaxseed, Linseed Statistics

Director of the Census, William L. Austin, announces that, according to preliminary figures, there were 27 mills which crushed flaxseed during the quarter ending Sept. 30th, reporting a crush of 134,884 tons of flaxseed and a production of 91,098,335 lbs. of linseed. These figures compare with 167,952 tons of seed crushed and 116,666,553 lbs. of oil produced for the corresponding quarter in '35; 120,194 tons of seed and 85,037,681 lbs. of oil in '34; 170,064 tons of seed and 113,412,535 lbs. of oil in '33; and 104,693 tons of seed and 68,502,774 lbs. of oil in '32.

Stocks of flaxseed at the mills on Sept. 30th amounted to 58,345 tons compared with 84,144 tons for the same date in '35; with 38,311 tons in '34; with 80,332 tons in '33; and with 74,576 tons in '32. Stocks of linseed reported by the crushers were 54,297,273 lbs. on Sept. 30, '36, compared with 66,713,098 lbs. for the same date in '35; with 72,637,360 lbs. in '34; with 65,797,839 lbs. in '33; and with 65,863,475 lbs. in '32.

3rd Quarter Factory Production

Factory production of fats and oils, exclusive of refined oils and derivatives, during the 3 months ended Sept. 30th was as follows: Vegetable oils, 484,565,176 lbs.; fish oils, 822,200,822 lbs.; animal fats, 375,492,864 lbs.; and greases, 82,-138,725,000 lbs., a total of 1,024,397,587 lbs.

Of the several kinds of fats and oils covered in the report the largest production of 229,185,566 lbs. was for lard. Next in importance was cottonseed oil with 216,386,557 lbs.; tallow, 144,667,247; linseed oil, 91,098,335 lbs.; coconut oil, 63,004,225 lbs.; soya bean oil, 44,199,118 lbs.

Fats and Oils from Pine

Fats and oils as byproducts of the pine paper developments of Dr. Charles H. Herty in the South were reported but a few weeks ago. Within 10 days an announcement followed of the formation of Resin Products Co., which will produce about 30,000 lbs. of fatty substances suitable for soap manufacture from the wastes developed at the Savannah plant of Union Bag. A plant to cost $100,000 is contemplated. Edward H. French is the owner of the patents to be used in the process.

Shipments of Solvents Heavier in Past Month

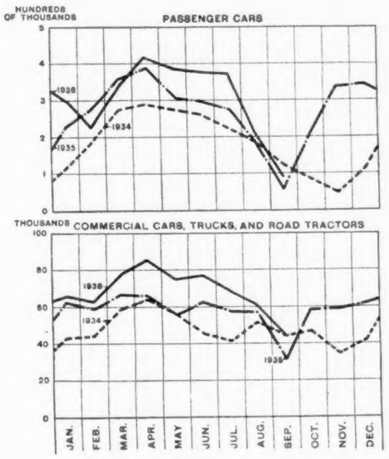
Automotive Manufacturers Return to Heavy Production Schedules on New Models—Rubber Consumption Remains High—General 2c Reduction in Tank Car Prices of Petroleum Solvents on the Pacific Coast—Anti-Freeze Now 30c at Works

Important Price Changes

	Oct. 31	Sept. 30
ADVANCED		
Naphtha, high solvency, No. 30	\$0.18¼	\$0.16½
DECLINED		
Alcohol, anti-freeze	\$0.30	\$0.34
Lacquer diluent, tks.:		
Group 3	.07⅞	.08⅜
Los Angeles	.10½	.13½
San Francisco	.11	.14

Consumption of solvents turned upward in October as the automobile and tire plants resumed heavy production schedules following the let-down while preparations for the new models were perfected.

Rubber consumption in September totalled about 46,000-47,000 tons, as compared with 46,657 tons in August and 37,086 tons in September of last year. P. W. Litchfield, Goodyear president, has



Automobile production declined as producers changed to new models.

estimated that tire production this year will reach 52,000,000 and that the production of tires this year will account for 50% of all rubber products produced. He states that original equipment will require 22 million, replacements, 29 million, exports, 1,300,000 units. He expressed the opinion that '36 consumption will probably be greater than in any previous year.

The notable increase in the use of rubber in automobile manufacture is well demonstrated by comparison of '35 with '29. Despite the fact that in the latter year there were sold approximately 5,622,000 cars compared with 4,120,000 in the former, slightly more rubber was used in the automotive industry in '35 than in '29. The figures stand at 394,000 long tons against 393,000 long tons.

Ford to Erect Tire Plant

Producers of solvents and chemicals used in rubber are highly interested in the definite report that Ford will build a tire plant at Dearborn which will have an initial capacity of 5,000 tires per day.

The higher alcohol anti-freeze schedule did not stand up very long in the face of keen competition. Leading producers who were quoting 34c delivered in carload lots changed to a flat 30c figure at the plant with freight charges to be added, so that, in most instances, the decline does not represent a decline of 4c per gal., and in many instances is no decline at all. September production of industrial alcohol totalled 16,892,968 proof gals. Production of completely denatured amounted to 2,144,764 wine gals. and specially denatured to 6,458,790 wine gals.

September production of crude methanol totalled 429,300 gals. and the refined production amounted to 2,695,591 gals. This compares with a production of 405,034 gals. of crude and 1,539,554 gals. of refined in September of 1935.

Lower Prices on the Coast

The petroleum solvents markets were featured by declines in the tank car quotations on the Pacific Coast. The first one occurred in lacquer diluent in the third week of the month and within a few days reductions of about 2c were announced in all of the solvents and naphthas with the one exception of low-aniline paint thinners. The markets in Group 3 and on the East Coast held firmly. One increase, however, was reported in the East on one grade of the high-solvency aromatic naphthas.

Atlas to Build $1,000,000 Chemical Plant

Will Produce Higher Alcohols, Mannitol and Sorbitol, on Large Scale—Wishnick Announces Plans for Large Carbon Black Plant—Champion Paper May Add New Texas Unit—Other Construction Reported—

Atlas Powder is planning immediate construction of a new plant to cost about $1,000,000 for the large scale production of its new higher alcohols. A large tract of land on the Delaware River has been purchased.

The first unit will be devoted to operations involving the electrolytic reduction of sugars, derived from corn, to their corresponding higher alcohols. The first 2 of these to be made will be the new products, Mannitol and Sorbitol, announced to the trade by Atlas only a year or so ago. The commercial production of these products opens up a new field of organic chemistry.

The 2 products only recently were laboratory curiosities selling at $400 or $500 a pound. They are what is known as hexahydric alcohols, having 6 hydroxyl groups compared to one in common grain or ethyl alcohol. For this reason they permit a greater variety of reactions and of resulting products and offer particularly interesting chemical possibilities.

Their uses have only been partially determined but they will be sold initially to the textile, paper, leather and pharmaceutical trades, and for synthetic resins and plastics.

New Carbon Black Plant

Robert L. Wishnick announced in N. Y. City last month plans for the erection of one of the largest carbon black plants in Texas. Continental Oil and Shamrock Oil and Gas are both financially interested in this project. Mr. Wishnick is also president of Wishnick, Tumpeer, large factors in the carbon black industry. Proposed plant, to be located midway between Dumas and Sunray, in Moore County, is to cost approximately $1,250,000, will have a daily capacity of 70,000,000 cu. ft. of natural gas, Mr. Wishnick reports. The gas will be from Continental Oil wells in Hutchinson County, and processed in plants of Shamrock Oil.

Champion Paper's Texas Unit

Champion Paper & Fibre's $3,500,000 paper pulp plant at Pasadena, Tex., now being constructed may be enlarged by another unit to cost an additional $3,000,000 if labor and other factors are favorable. Initial plant will start in February. Approximately 10 tons of liquid caustic daily will be produced. Company is said to be contemplating marketing chlorine, turpentine, hydrogen, liquid resin, and other by-products.

Building Plans Revealed

LaMotte Chemical Products purchases a 10-acre plot on the outskirts of Baltimore and eventually will build. Company manufactures equipment for pH determination and control.

Industrial Rayon will build the first unit of its "continuous" process of manufacture at Painesville, Ohio. Plans call for expenditure of approximately $7,500,000.

Paper Makers Division of Hercules is building a $100,000 addition at Elroy, Wis.

Staley Manufacturing will erect a new chemical laboratory and power plant at Decatur, Ill. Company has spent nearly $2,000,000 in additions this year.

Pioneer-Flintkote will erect a $1,000,000 plant in Los Angeles to make corrugated box board, chip board, and asphalt emulsion.

Cyanamid awards contracts for a $100,-000 addition at Bridgeville, Pa., plant.

Eastern States Farmers' Association is requesting permission to build a $500,000 fertilizer plant at Cambridge, Mass.

Swift will erect a $50,000 fertilizer unit at Birmingham, Ala.

Newberry Lumber & Chemical plans an addition to its Newberry, Mich., plant.

International Paper & Power through its subsidiary, Southern Kraft, will erect an $8,000,000 plant at Georgetown, S. C., to make kraft paper and board.

Raw Materials

Naval Stores Prices Rise—Plan Restriction Next Year—Shellac Weak—

Naval stores prices went into higher ground last month. Both domestic and foreign demand improved somewhat. The unsettled state of foreign exchange and the devaluation of the lira and franc were, however, unfavorable angles to an already badly muddled situation.

The chances are bright that restriction of production of naval stores will be carried into next year. In fact a tentative agreement has already been reached between governmental officials and representatives of the American Turpentine Farmers' Association. New program will probably run along the same lines of the current plan which is based upon government subsidies. Victory of the administration on Nov. 3d, lent additional hope that the plan would be continued in the coming year.

Shellac Declines—Crop Outlook

Shellac prices were down last month reflecting the weakness in the primary markets. In some quarters it is said further declines are likely when heavier purchasing returns.

Weather conditions having proved favorable, the final figures in terms of sticklac of the Baisakhi lac crop, 1936, are practically identical with the preliminary figures published in March, '36. Actual maundage at 760,000 (1 maund = 82 lbs.) is very near the estimated normal for this crop of 809,000, and as the *Jethua* (a crop intermediate to the Aghani or Kusmi) crop is estimated at an additional 100,000, India is faced with the disposal of a very large quantity of lac, with the demand in America and elsewhere in the world definitely on the up-grade, though the large stocks in London are still influencing price and, to some extent, consumption.

Main inference to be drawn from the quoted figures is that lac will continue to be a cheap commodity for some time to come. At current rates in the United Kingdom, lac is being sold below the cost of production.

Obituaries

James T. Skelly, 59, a Hercules vice-president and director, died on Oct. 31st at his home in Wilmington, following an attack of pneumonia. He had been seriously ill for 6 weeks of complications and in his weakened condition could not fight off the pneumonia attack.

Mr. Skelly was probably one of the best known men in the explosives-consuming industries not only because of his 44 years of service but because of his capacity for making friends. As chairman of the finance committee and member of the executive committee he aided in the development of Hercules from its inception in 1913 as an explosives company to its present position in the chemical industry.

Mr. Skelly was born in Nashville, Tenn., and was educated in the public schools there. He entered the powder business, with the Laflin and Rand Powder Co. in 1892 and had been associated with powder companies since. He joined du Pont in 1903, moving to Wilmington then, and on Jan. 1, 1913, was made vice-president of Hercules Powder when the du Pont Co. was divided into three companies by court decree, which position he held until his death.

Iredell Jones, 63, well-known fertilizer man in the South, on Oct. 10th.

Harry W. Deitrich, 58, prominent sugar chemist, died on Oct. 13th at Noblesville, Ind.

Chester A. Howe, vice-president and director of Carbic Color & Chemical on Oct. 3rd.

Edgar A. Stevens, 50, president of the lacquer and chemical firm of Pierce & Stevens in Buffalo, on Oct. 5th.

William P. Fuller, 75, founder of the San Francisco paint firm of W. P. Fuller & Co., on Sept. 29th.

Clavere L. Bartley, 71, foreman of the plant of the Pennsylvania Wood Products Chemical Wks. at Coryville, Pa., on Oct. 12th.

Russell Morin, 45, secretary and manager of International Chemical of Chicago, died of a heart attack at Logansport, Ind., on Oct. 4th.

Howard N. Laird, 42, northern sales manager for V.-C., died on Oct. 21st in a hospital in Richmond. He had been ill since July.

Robert Henry Adams, 68, at one time president of American Linseed, died on Oct. 15th at Greenwich, Conn., following an operation for appendicitis.

Mary Henderson McKesson, daughter of Irving McKesson, vice-president and secretary of N. Y. Quinine & Chemical, died on Oct. 26th.

John E. Dowd, 56, a chemist with Pease Laboratories in N. Y. City, died on Oct. 20th.

Oliver Gould Jennings, 71, a director of U.S.I. and also of McKesson & Robbins, died on Oct. 13th of pneumonia.

Gordon L. Naylor, 48, assistant treasurer of du Pont, died of a heart attack on Oct. 8th at his home in Wilmington, Del.

Newell H. Stewart, 75, for several years a representative for Merck and previous to that for companies which were absorbed by Merck, died on Oct. 6th.

Samuel Warren, 46, sales engineer for Building Chemicals Corp., N. Y. City, died from the effects of a fall on Oct. 4th.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF MARCH 3, 1933

Of *Chemical Industrics*, published monthly at New Haven, Conn.

State of Connecticut, County of New Haven, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Williams Haynes, who, having been duly sworn according to law, deposes and says that he is the Publisher of *Chemical Industries*, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Williams Haynes, 149 Temple St., New Haven, Conn.; Managing Editor, Walter J. Murphy, 149 Temple St., New Haven, Conn.; Business Manager, William F. George, 25 Spruce St., New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent. or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Haynes & George Co., 149 Temple St., New Haven, Conn.; Williams Haynes, 149 Temple St., New Haven, Conn.; William F. George, 25 Spruce St., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent. or more of total number of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is ——. (This information is required from daily publications only.)

WILLIAMS HAYNES, *Publisher.*

Sworn to and subscribed before me this 3rd day of October, 1936. Francis J. Smith, Notary Public. (Comm. expires February, 1937.)

Market Values at Highest Point Since October 1930

October Appreciation Largest of Any Month this Year with the Exception of January—Chemical Stocks Strong—Several Chemical Companies Report Largest Earnings in Their History—Atlas Reduces Dividend Rate on Preferred—J. T. Baker Chemical Declares $1 Dividend—

The stock market made irregular gains last month, despite the widespread tendency of many traders to await the outcome of the national election before making new commitments. Four reasons have been advanced for the persistence of the upward surge in the face of the strong feeling that a pre-election slump would occur. First, a perfect wave of very favorable earnings statements; second, large purchases of American securities from abroad; third, an almost universal belief that no matter what the outcome of the election was that business would continue to go forward, and fourth, the largest dividend total for an October since 1931.

The chemical stocks were particularly strong last month.* A compilation of 10 of the leading chemical common stocks shows a net gain of 5½% and a total appreciation of $200,886,978. The net gains in value and the single decline, Monsanto, are given:

Air Reduction	+	$8,233,765
Allied Chemical	+	21,611,592
Commercial Solvents	+	1,648,582
du Pont de Nemours	+	134,171,685
Freeport Texas	+	796,380
Mathieson Alkali	+	214,548
Monsanto Chemical	—	5,293,329
Texas Gulf Sulphur	+	14,400,000
Union Carbide	+	32,294,279
U. S. Ind. Alcohol	+	1,809,476
Total appreciation		$209,886,978
Per cent. gain	5½	

The alcohol and solvents companies' securities moved upward for the most part last month on the belief that a firmer price structure for the coming year would prevail. Some mystery surrounded the strength in the fertilizer stocks for this is normally the dull season in that field. However, the advance was attributed to the figures showing the autumn fertilizer sales to be running 30% ahead of a year ago. In addition, the 3d quarter statement of AAC showed a small net profit instead of the usual seasonal deficit generally reported at this time of the year.

Best Month But One

The general rise in the market under such unusual conditions is made clearer when it is stated that with the exception of last January the market during October made the most extended gain of any other month this year. The largest percentage rise was a 15% appreciation in the mining group, second were the oils with a 14% rise, and third were the agricultural shares. The sugar group was the only one not to register a net gain.

Most Profitable Year

The chemical industry generally is having the most profitable year in its history with the current earnings of the leading companies even exceeding the phenomenal records made at the height of the boom in the late 20's. Du Pont had the best chemical earnings in its history if the General Motors' income is disregarded; Carbide reported the best third quarter since '29; gains made by both Hercules and Atlas were particularly noteworthy, and the appreciation in Hercules' stock price especially indicates how the news was received in financial circles.

Hercules, which now manufactures 70% chemicals and 30% explosives, reported third quarter net of $1,159,405 or $1.72 a share on 583,870 shares, nearly double the 89c reported in the '35 period. Atlas reported $377,982 or $1.15 on 248,967 shares against 93c a year ago.

3rd Quarter Earnings

Texas Gulf Sulphur reported $2,912,383 or 76c a share on 3,840,000 shares of capital stock, its best three months' earnings since 1930. General high rate of industrial activity plus improved foreign sales were responsible for the improvement.

Report of I.A.C. and subsidiaries for fiscal year ended June 30th, shows net profit of $23,193 after ordinary taxes, interest, depreciation, depletion and other charges.

Above net profit is equal to 23c a share on 100,000 shares of 7% cumulative prior preference stock (par $100) on which accrued unpaid dividends aggregated $5,950,000, or $59.50 per share at June 1, '36. This compares with net profit of $269,388, or $2.69 a share, on prior preference stock in preceding year.

Report states: "A few years ago depreciation was discontinued, for the time being, on certain of our properties which an appraisal showed had been depreciated below their sound value. As of July 1, '35, depreciation charges were resumed on these properties. Effect of this was to increase our depreciation charges for the year by approximately $71,000."

Monsanto Earnings at Peak

Monsanto's net profit for the third quarter was $1,181,125 after charges, federal income taxes, and minority interest, but before subsidiary dividends, equal after allowing for subsidiary preferred dividends, to $1.04 a share on 1,114,410 shares.

* Market value of the chemical stocks on the N. Y. Stock Exchange on Nov. 1st, totalled $6,406,150,555, as compared with $6,059,914,088 on Oct. 1st, a net gain of $346,236,467 for the month. On Nov. 1st the average price was $78.43, as compared with $74.20 on Oct. 1st, a net gain of $4.23. Value of all stocks on the Exchange on Nov. 1st amounted to $58,507,236,527, the highest point reached since Oct. 1, 1930, when the total was $60,143,000,000.

Dividends and Dates

Name	*Div.*	*Stock Record*	*Payable*
Allied Chem.	$1.50	Oct. 9	Nov. 2
Am. Metal, pf. ac.	$4.00	Nov. 21	Dec. 1
Am. Smelt. & Ref.	50c	Nov. 6	Nov. 30
Am. Smelt. & Ref., 1st pf	$1.50	Oct. 9	Oct. 31
Am. Smelt. & Ref., 2nd pf.	$1.75	Oct. 9	Oct. 31
Archer-Daniels, pf.	$1.75	Oct. 21	Nov. 2
Atlas Powder, pf.	$1.25	Oct. 20	Nov. 2
Canadian Indust., Cl. A	$1.25	Sept. 30	Oct. 31
Canadian Indust., Cl. B	$1.25	Sept. 30	Oct. 31
Catalin, Spec.	40c	Nov. 15	Dec. 15
Colgate-Palmolive-Peet	12½c	Nov. 6	Dec. 1
Cons. Chem. Ind., Cl. A	37½c	Oct. 15	Nov. 1
Dow Chemical	60c	Nov. 2	Nov. 16
Dow Chemical, new pf.	$1.25	Nov. 2	Nov. 16
Duval Texas Sulphur, in.	50c	Oct. 23	Nov. 15
Fansteel Met., pf.	$1.25	Dec. 15	Dec. 31
Freeport Texas	25c	Nov. 18	Dec. 1
Freeport Texas	$1.50	Jan. 1	Feb. 1
Gold Dust	15c	Oct. 10	Nov. 11
Great Western Electrochemical	80c	Nov. 4	Nov. 14
Int'l Nickel, pf.	$1.75	Oct. 3	Nov. 2
Int'l Printing Ink	50c	Oct. 15	Nov. 1
Int'l Printing Ink, pf.	$1.50	Oct. 15	Nov. 1
Jones & Laughlin, pf. acc.	$1.75	Nov. 30	Dec. 15
Lindsay Light & Chem.	Omitted, Oct. 28, '36		
McKesson & Robbins, pf.	75c	Dec. 1	Dec. 15
Nat'l Lead, Cl. B, pf	$1.50	Oct. 16	Nov. 2
Nat''l Lead, pf. A	$1.75	Nov. 27	Dec. 15
N. J. Zinc	50c	Oct. 20	Nov. 10
Procter & Gamble	37½c	Oct. 23	Nov. 14
Sherwin-Williams, pf.	$1.25	Nov. 14	Dec. 1
Sherwin-Williams	$1.00	Oct. 31	Nov. 16
Solvay Amer. Invest., pf.	$1.37½	Oct. 15	Nov. 16
United Dyewood, pf.	$1.75	Dec. 1	Jan. 1
U. S. I.	Omitted Aug. 23		
Westvaco Chlorine	25c	Nov. 10	Dec. 1
Westvaco Chlorine, 5% pf.	25c	Oct. 10	Nov. 1

Price Trend of Chemical Company Stocks

	Sept. 30	Oct. 2	Oct. 9	Oct. 16	Oct. 23	Oct. 31	Net gain or loss last month	Price on Oct. 31, 1935	1936 High	1936 Low
Air Reduction	74½	75	76¾	74¾	77	77¾	+ 3¼	103⅞	81¾	58
Allied Chemical	224	227½	233	234	229½	233	+ 9	127	245	157
Columbian Carbon	124½	126½	...	...	121¼	122	— 2½	66¼	136½	94
Com. Solvents	15½	15⅝	17¼	16½	16¼	16⅛	+ ⅝	18¼	24⅝	14¼
du Pont	161⅞	163	131	169	169	174	+12⅛	92¼	173½‡	133
Hercules Powder	113¾	...	...	122	130	130	+16¼	...	131‡	84
Mathieson	35¾	36	35½	35	34⅞	36	+ ¼	24⅛	37⅝	27½
Monsanto	98¼	98¼	97½	93½	94½	94¼	— 4	55⅛	103	79
Std. of N. J.	60⅜	61⅝	64⅝	64⅛	67⅞	68½	+ 8⅛	40⅜	70	51⅛
Texas Gulf S.	35¼	35¾	36⅞	36⅞	37⅛	39	+ 3¾	36½	39⅛	33
Union Carbide	97	97¾	101	100½	99½	100½	+ 3½	...	101⅜	71⅝
U. S. I.	34⅛	35	37⅝	40½	38¼	39	+ 4⅞	37	59	31¼

* Old stock; ‡ New high.

In preceding quarter company reported a balance of $1,035,730 after depreciation, federal income taxes, minority interest and subsidiary preferred dividends, equal to 93c a share on 1,114,410 shares and in September quarter of '35 balance after charges, federal income taxes and subsidiary preferred dividends was $884,550 or 89c a share on 987,876 shares.

Sales and earnings for the third quarter of '36 constituted an all-time peak.

DuPont Earns $2.04 in 3rd Quarter

Du Pont reports $2.04 a share earned on its common for quarter ending Sept. 30th. This figure, which includes income from General Motors investment equivalent to about $1.09 on each share of du Pont common stock, compares with total earnings of $2.06 a share in second quarter of 1936, which latter figure included income from General Motors investment amounting to about $1.11 on each share of du Pont common stock. In the third quarter of 1935, the earnings were $1.48 a share, which also included income from General Motors investment amounting to about 68c a share on du Pont common stock.

Carbide Reports $8,111,897

Report of Carbide and subsidiaries for quarter ended Sept. 30th shows net profit of $8,111,897 after interest, depreciation, federal income taxes, etc., equivalent to 90c a share on 9,000,743 no par shares of stock. No mention was made of federal surtax on undistributed profits. This compares with $7,936,660, or 88c a share in preceding quarter and $6,154,725, or 68c a share, in September quarter of previous year.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1936	Net income 1935	Common share earnings 1936	Common share earnings 1935	Surplus after dividends 1936	Surplus after dividends 1935
Air Reduction:							
September 30 quarter	§$1.00	$1,939,985	$1,387,454	$0.76	$0.55	*......	*......
Nine months, September 30	§1.00	5,272,461	3,895,787	2.08	1.55	*......	*......
Amer. Agricultural Chem.:							
Per, July 1-October 1	*w*.75	23,158	†109,600	.11	....	......	......
American Potash & Chemical:							
Six months, June 30	*w*1.00	*v*828,832	......	1.57	....	......	......
Archer-Daniels-Midland:							
Year, June 30	*w*.50	1,891,612	2,525,745	3.04	$4.20	......	......
Bon Ami:							
††September 30 quarter	§*b*2.00	309,975	272,457	*x*.86	*x*.77	*......	*......
Nine months, September 30	§*b*2.00	897,728	767,231	*x*2.51	*x*2.20	*......	*......
Commercial Solvents:							
September 30 quarter	.60	583,452	504,867	.22	.19	*......	*......
‡‡Nine months, September 30	.60	1,667,400	1,604,522	.63	.61	*......	*......
Consol. Chemical Industries:							
September 30 quarter	*a*1.50	191,682	126,590	*a*.80	*a*.56	......	......
‡‡Nine months, September 30	*a*1.50	434,903	359,436	*a*1.81	*a*1.60	......	......
Davison Chemical:							
Six months, June 30	*f*....	184,310	......	.36	....	......	......
E. I. du Pont de Nemours & Co.:							
g September 30 quarter ...	§3.60	23,875,048	17,704,182	*j*2.04	*j*1.48	$4,558,682	$2,251,379
g Nine months, September 30	§3.60	62,567,019	40,154,667	*j*5.31	*j*3.22	12,334,245	7,053,659
Gold Dust Corp.:							
September 30 quarter	*w*.15	424,109	*......	.23	*....	*......	*......
Hercules Powder:							
September 30 quarter	5.00	1,159,405	704,810	1.72	.89	......	......
Nine months, September 30	5.00	2,931,449	2,248,490	4.23	2.90	......	......
Internat'l Printing Ink:							
††September 30 quarter ...	2.00	375,613	285,411	*h*.96	*h*.72	......	......
Nine months, September 30	2.00	961,324	775,018	*h*2.34	*h*1.96	276,749	340,779
Twelve months, September 30	2.00	1,267,063	*......	*h*3.08	....	......	......
Jones & Laughlin Steel:							
September 30 quarter	*f*....	1,870,866	233,914	1.46	*p*.40	......	......
Nine months, September 30	*f*....	2,053,320	†516,463	*p*3.50	....	......	......
Koppers Co. and subs.:							
Six months, June 30.......	....	664,839	......	....	....	......	......
Twelve months, June 30	....	1,796,043	......	....	....	......	......
Lindsay Light & Chemical:							
Nine months, September 30	*f*....	16,479	41,689	.08	.52	......	......
Mathieson Alkali Works, Inc.:							
September 30 quarter	1.50	484,489	331,039	.54	.35	......	......
Nine months, September 30	1.50	1,202,372	978,892	1.30	1.03	......	......
Mead Corp.:							
Twelve weeks, September 5	*f*....	195,773	20,629	.25	*p*.62	......	......
36 weeks, September 5	*f*....	600,215	281,757	.79	.24	......	......
North American Rayon:							
g 12 weeks, September 6 ...	*y*1.375	546,271	......	....	....	......	......
g 36 weeks, September 6 ...	*y*1.375	1,258,732	......	....	....	......	......
Penick & Ford:							
September 30 quarter	3.00	289,431	189,324	.78	.51	......	......
Nine months, September 30	3.00	982,486	667,776	2.66	1.80	......	......
Procter & Gamble:							
September 30 quarter	§1.50	6,629,564	3,604,505	1.01	.53	*......	*......
Rustless Iron & Steel:							
September 30 quarter	*f*....	‡103,150	*......	....	....	......	......
Nine months, September 30	*f*....	228,273	129.779	*h*.28	*h*.18	......	......
Spencer Kellogg & Sons:							
Year, August 29	1.60	1,310,860	1,112,395	2.62	2.22	......	......
Texas Gulf Sulphur:							
September 30 quarter	2.00	2,912,383	1,810,038	.76	.47	992,383	*d*109,962
Nine months, September 30	2.00	7,723,391	5,265,209	2.01	1.37	1,963,391	*d*494,791
Twelve months, September 30	2.00	9,926,198	*......	2.58	....	......	......
Union Carbide & Carbon:							
September 30 quarter	*w*.70	8,111,897	6,154,725	.90	.68	*......	*......
Nine months, September 30	*w*.70	23,550,950	16,780,882	2.61	1.86	*......	*......
Twelve months, September 30	*w*.70	34,024,317	23,588,724	3.78	2.62	*......	*......
United Dyewood:							
Six months, June 30	*w*.25	192,805	148,082	.63	.29	*d*51,195	41,000
U. S. Smelting Refining & Mining:							
Eight months, August 31 ..	*y*10.00	3,782,769	4,173,521	5.08	5.82	*......	*......
Valspar Corp.:							
Nine months, August 31 ..	*f*....	116,719	†171,652	*p*3.83	....	......	......

w Last dividend declared, period not announced by company; † Net loss; *v* Estimated; § Plus extras; *x* On Class B shares based on participating provisions; * Not available; *a* On Class A shares; *j* On average number of shares; *f* No common dividend; *p* On preferred stock; *y* Based on comparison of company's reports for 6 months ended June 30 and quarter ended Sept. 30; *h* On shares outstanding at close of respective periods; *d* Deficit.

Approve Capital Reduction

Stockholders of Vanadium Corp. have approved proposal to reduce stated value of capital to $3,783,673 from $11,351,020. Reduction was made to eliminate profit-and-loss deficit, which amounted to $4,172,973 as of June 30th, last. W. C. Keeley, Prescott S. Bush and Broderick Haskell Jr., have been elected directors.

Shifts Dividend Dates

United Carbon has notified stockholders that they may expect their next dividend check in the week preceding Dec. 31, instead of Jan. 1, company's usual payment date. Although United Carbon is the first company to make known its intention of moving ahead its dividend date in order to avoid taxes, other companies will adopt a similar procedure. It is considered likely that more dividend checks will be received as "Christmas presents" this year than in any year previously.

Dividend Changes Reported

J. T. Baker Chemical has declared a dividend of $1 a share on the common, of which 50c was paid on Sept. 30th. The other half is payable on Dec. 15th to stockholders of record Dec. 1st. Last declaration, 30c, was disbursed in '31.

International Nickel has increased its common dividend for the 3rd consecutive time with the declaration of 40c.

Westvaco Chlorine Products has declared a quarterly dividend of 25c on the common, placing the stock on a $1 basis. Three months ago 10c extra and regular quarterly of 10c was declared. This is the first rate increase since payments were resumed on the stock in June, '33.

Atlas Powder Co. has declared a quarterly dividend of $1.25 on the preferred stock, payable Nov. 2nd to stock of record Oct. 20th. This establishes a rate of 5% annually compared with the previous rate of 6% annually. Annual rate on preferred was reduced by a charter amendment, approved by stockholders on Feb. 24, '36. To compensate for the lower rate, the 5% preferred carries with it a convertible privilege.

Chemical Stocks and Bonds

1936 October Last	1936 October High	1936 October Low	1935 High	1935 Low	1934 High	1934 Low	Sales: Number of shares Oct. 1936	Sales: Number of shares 1936	Stocks	Par $	Shares Listed	An. Rate*	Earnings $-per share-$ 1935	Earnings $-per share-$ 1934
NEW YORK STOCK EXCHANGE														
77¾	81¾	58	57½	35	37⅝	30⅝	267,300	29,600	Air Reduction	No	2,523,864	$2.50	2.10	1.66
233	245	157	173	125	160¼	115⅛	286,200	15,600	Allied Chem. & Dye	No	2,214,099	6.00	8.71	6.83
74¾	76	49	57¾	41½	48	25¼	110,800	21,100	Amer. Agric. Chem.	100	315,701	2.00	.....	p6.37
30¾	32¾	20½	35¾	22½	62½	20¾	320,000	59,600	Amer. Com. Alcohol	20	260,716	None	3.16	3.57
41	50	37	52	36	39⅛	26¼	69,200	6,400	Archer-Dan-Midland	No	541,546	1.50	.....	p4.21
72¾	73	48	48½	32¾	55½	35¼	53,100	6,400	Atlas Powder Co.	No	234,235	2.25	2.81	2.49
126¼	127	112	115	106¾	106¾	83	5,290	290	5% cum. pfd.	100	88,781	5.00	16.93	13.54
27	32¼	21¾	35⅜	19½	44⅞	17⅛	880,100	117,200	Celanese Corp. Amer.	No	987,800	.50	1.99	1.25
17¾	20½	13	21	15⅛	18⅛	9⅜	669,900	139,100	Colgate-Palm.-Peet	No	1,985,812	.75	1.36	1.16
104½	106½	100	107¼	101	102½	68½	29,100	11,000	6% pfd.	100	254,500	6.00	16.79	16.14
123	136½	94	101¼	67	77¼	58	106,400	5,800	Columbian Carbon	No	538,154	4.50	5.56	3.93
16⅛	24⅝	14¼	23⅞	16½	36¾	15¾	1,825,100	152,700	Commer. Solvents	No	2,635,371	.60	1.02	.89
70⅛	82½	63⅝	78⅜	60	84½	55½	411,400	43,700	Corn Products	25	2,530,000	3.00	2.62	3.16
160	168½	158	165	148¼	150½	135	9,100	1,400	7% cum. pfd.	100	243,739	7.00	33.97	39.65
52¼	58¼	42	50⅜	35½	55¼	29	45,300	2,300	Devoe & Rayn. A	No	95,000	2.00	2.89	2.36
174	174	133	146½	86⅝	103⅞	80	433,900	53,200	DuPont de Nemours	20	10,871,997	5.00	5.04	3.63
131	133⅛	129	132	126⅞	128½	115	33,500	6,800	6% cum. deb.	100	1,092,699	6.00	56.94	42.73
171½	185	156	172¼	110½	116½	79	103,500	9,500	Eastman Kodak	No	2,250,921	6.00	6.90	6.28
163½	166	152	164	141	147	120	3,520	90	6% cum. pfd.	100	61,657	6.00	258.09	235.22
26	35⅝	23½	30⅝	17¼	50⅜	21½	313,500	6,100	Freeport Texas	10	784,664	1.00	1.78	1.76
120	135	118½	125	112½	160⅛	113½	......	1,510	6% conv. pfd.	100	25,000	6.00	121.30	120.08
43	55¼	39¾	49½	23⅜	28⅜	15⅝	318,800	28,100	Glidden Co.	No	603,304	2.00	.....	x 2.91
54	55	52¼					30,860	5,600	4½% cum. pfd.	50	200,000	2.25	.....	.....
102	133	102	119½	85	96⅞	74	19,000	2,900	Hazel Atlas	25	434,409	5.00	7.58	5.21
130	131	84	90	71	81⅝	59	44,400	3,100	Hercules Powder	No	582,679	5.00	4.23	3.94
128	135	126	131	122	125¾	111	3,570	310	7% cum. pfd.	100	105,765	7.00	36.30	28.79
38⅜	38⅞	25⅝	36⅜	23½	32	19⅜	437,100	67,900	Industrial Rayon	No	600,000	1.68	1.00	2.23
3⅝	5⅞	2⅞	5	2⅝	6⅛	2	316,900	15,100	Intern. Agricul.	No	436,049	None	.....	p—.99
32	41	22¾	42¾	26	37¼	15	68,500	9.900	7% cum. pr. pfd.	100	100,000	None	.....	p2.69
61¼	63	43¼	47¼	22¼	29¼	21	2,004,000	179,300	Intern. Nickel	No	14,584,025	1.40	1.65	1.14
29½	30	23	36¼	25	32	21	34,400	5,000	Intern. Salt	No	240,000	1.50	1.32	2.02
32⅞	36¾	29¾	36¼	31	33⅛	15¾	25,700	3,700	Kellogg (Spencer)	No	500,000	1.60	.....	v2.22
71⅜	72½	47¼	49¼	21½	43⅞	22½	607,900	78,800	Libbey Owens Ford	No	2,559,042	2.00	3.26	1.25
42	44¼	32½	37¼	24½	35⅜	16⅛	177,000	25,000	Liquid Carbonic	No	342,406	1.60	v3.06	1.96
36	37½	27½	33⅞	23¾	40¾	23½	291,500	29,600	Mathieson Alkali	No	650.436	1.50	1.44	1.20
94¼	103	79	94¾	55	61⅝	39	148,800	13,000	Monsanto Chem.	10	864,000	1.50	3.84	3.03
29⅜	31⅜	26⅜	20⅝	14½	17	13½	210,900	52,600	National Lead	10	3,098,310	.50	1.08	.84
158	168	155	162½	150	146½	122	2.600	800	7% cum. "A" pfd.	100	243,676	7.00	25.40	20.12
142	144	137¾	140½	121⅝	121½	100½	3,450	380	6% cum. "B" pfd.	100	103,277	6.00	49.05	35.36
15¾	17¼	9	10⅞	4⅜	13	5½	993,000	113,100	Newport Industries	1	519,347	None	.57	.31
153	164	128	129	80	94	60	124,300	17,500	Owens-Illinois Glass	25	1,200,000	5.00	6.52	5.41
51⅞	52½	40¼	53¾	42⅜	44⅜	33⅛	266,500	52,800	Procter & Gamble	No	6,410,000	1.75	.....	p 2.23
119	122½	117	121	115	117	102½	3,850	350	5% pfd. (ser. 2-1-29)	100	171,569	5.00	.....	p88.13
8	10¼	5⅝	8¾	4	6¾	3⅛	456,400	52,100	Tenn. Corp.	5	857,896	None	.22	.27
39	39⅛	33	36¾	28¾	43¼	30	385,600	63,800	Texas Gulf Sulphur	No	2,540,000	2.00	1.94	1.81
100½	101⅜	71⅝	75¾	44	50⅞	35⅞	700,200	69,000	Union Carbide & Carbon	No	9,000,743	2.40	3.06	2.28
95¼	95½	68	78	46	50⅜	35	121,400	12,300	United Carbon	No	370,127	2.40	4.71	3.55
38¾	59	31¼	50⅝	35⅛	64¾	32	487,700	76,600	U. S. Indus. Alco.	No	391,033	1.00	2.16	4.04
22¼	27¼	16¼	21¾	11¼	31¾	14	468,600	45,800	Vanadium Corp.-Amer.	No	366,637	None	—1.13	—2.29
5⅝	8⅜	4⅛	4⅝	2½	5⅜	1⅞	392,800	44,700	Virginia-Caro. Chem.	No	486,000	None	.....	p—.79
40	48¾	28¾	35¾	17½	26	10	269,100	43,900	6% cum. part. pfd.	100	213.392	None	.....	p4.20
24¼	32	19¾	25½	16¾	27¼	14⅞	132,600	5,200	Westvaco Chlorine	No	284.962	.50	1.63	1.55
33⅝	35¼	32⅜					7,400	7,400	Westvaco Chlorine, cum. pfd.	30	192,000	1.50	.....	.....
NEW YORK CURB EXCHANGE														
36¼	40¾	29¼	30	15	22½	14⅝	523,800	69,700	Amer. Cyanamid "B"	No	2,404,194	.60	1.61	.99
2⅝	3¾	2½	4	2	4⅛	2⅜	......	9,900	British Celanese Am. R.	10	2,806,000	None	—.71%	—.58%
106	116¼	99¼	115	90	105¼	81	3,695	2,625	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	21.96	16.37
110	116	107¼	111¼	97½	102	83	8,150	1,375	7% cum. prior pfd.	100	213,668	7.00	35.34	28.13
11	16½	9	15	7	19	7	9,500	3,450	Celluloid Corp.	15	194,952	None	—.95	—1.67
14	15	11⅞	14½	11⅝	14⅜	10½	5,900	1,300	Courtaulds' Ltd.	1 £	24,000,000	7½%	7.51%	7.57%
128	130	94⅛	105½	80½	91	67½	59,300	7,300	Dow Chemical	No	945,000	2.40	4.42	3.32
6⅞	10¾	5	12½	6¼	10¾	4	103,100	13,500	Duval Texas Sulphur	No	500.000	None	.16	z .25
42	55	40	58	37	40¾	19	7,600	900	Heyden Chem. Corp.	10	147,600	1.25	3.22	3.07
129¼	140	98¼	97¼	46¾	57½	39	65.540	5,500	Pittsburgh Plate Glass	25	2,141,305	4.00	5.32	2.69
134¾	145½	117	128⅞	84	90½	47¼	66,250	6,700	Sherwin Williams	25	635.583	4.00	.....	y6.19
111	116	110	113½	106	109¾	100	4,690	310	5% pfd. cum.	100	155,521	5.00	.....	y33.17
PHILADELPHIA STOCK EXCHANGE														
162	162	114¼	116¾	76½	75	50¼	3,300	600	Pennsylvania Salt	50	150,000	6.00	v8.57	v5.94

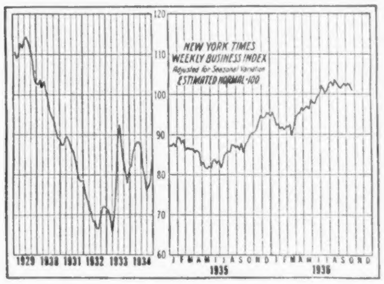
1936 October Last	1936 October High	1936 October Low	1935 High	1935 Low	1934 High	1934 Low	Sales Oct. 1936	Sales 1936	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE													
110⅞	117½	110½	116	104½	106¾	83⅞	3,809,000	805,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
28½	31	28	29¾	7⅜	17¾	5	1,837,000	165,000	Anglo Chilean Nitrate inc. deb.	1967	4½-5		12,433,000
101	101¾	92½	94½	77⅜	88	61½	945,000	122,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
99¾	102¾	96¾	100¼	91⅛	92	62	957,000	126,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
30⅝	35¾	21	21½	7	19½	5⅛	10,787,000	882,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
96	97	66½	94	65	98½	89⅞	139,000	65,000	Montecatini Min. & Agric. deb. 7's with war.	1937	7	J. J.	7,075,045
27	35	24½	38	32⅛	74½	34½	53,000	16,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
105	105	103	104	91½	90	65½	447,000	43,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
92¾	96⅞	85¾	94¼	66	89½	62	1,153,000	32,000	Vanadium Corp. conv. 5's	1941	5	A. A.	4,261,000

† Year ended 5-31-35; *p* Year ended 6-30-35; *v* Years ended 6-1-35 and 6-1-36; *y* Year ended 8-31-35; *z* Year ended 8-31-35; * Including extras; *x* Year ended 10-31-35.

Industrial Trends

Usual Pre-Election Business Slump Did Not Appear in October—Retail Sales are 12% Ahead of Last Year—Favorable Outlook for Balance of Final Quarter—

The approach of one of the most important national elections in the history of this country failed to exert any adverse effect on immediate business. The



N. Y. Times Index of Business Activity Shows the Steady Improvement in Business Conditions.

high rate of activity that has prevailed for the past few months continued unabated. In some quarters the opinion is expressed that the surge forward has been maintained at such a rapid pace that some recessions are in order; in other quarters just as strong beliefs are indicated that improvement will continue through the final quarter of the year.

Steel activity remains at an encouraging level—above 70%. Automotive production is rapidly returning to normal and present schedules call for about 100,000 units or more weekly. Electrical consumption is running at much higher levels when comparison is made with the corresponding weeks of last year and the same thing is true of carloadings.

Retail sales generally are running 12 to 18% above last year, while wholesale bookings increased to approximately 20% over the '35 comparative figures. The weather was very spotty in various sections, so that seasonal retail sales in certain items have been somewhat retarded. Wholesalers are extremely optimistic over holiday business.

Commodity Prices Up Slightly

Movement in the commodity prices was mixed last month. Most of the accredited indices, however, showed a slight upward trend. *The N. Y. Times* Index of Business activity was slightly off at the close of the month. On Sept. 26th the index stood at 102.7 as compared with 101.1 on Oct. 24th. The decline was caused largely by two factors, a drop in electrical consumption when a rise is normal and a smaller increase in automobile production than was generally anticipated. On Oct. 26, '35 the index stood at 90.2.

Activity in nearly all of the major industries remains at very encouraging levels. Production schedules in the glass, paper, tanning, and rubber fields are much improved over the same period of last year. Paint manufacturers have now passed the peak of fall business, but this year's total is near the record output of '29 and producers are satisfied. Building operations are reviving rapidly, particularly in the residential division, so that both the paint and glass industries should continue to enjoy satisfactory volume for many months to come. Fertilizer sales are making a very favorable showing but, of course, the volume at this time of the year represents but a very small percentage of the year's total business.

Threats of labor unrest continue to throw a shadow over the industrial picture. The latest industry to suffer is the glass field. The situation in the Akron tire area is still unsettled, but a more favorable turn was taken last month in the labor situation in steel. Leaders of the industry express the opinion that if there are no strikes that a rate above 70% probably will be maintained over the balance of the last quarter. In certain quarters, however, it was feared that the drive to unionize the steel industry would be accelerated after the election, specially so if President Roosevelt should be returned.

The general consensus of opinion appears to be that business activity will advance steadily during the coming months, but because of the high levels already reached, the rate of gain may fall below the usual seasonal movement. But by no means has the tremendous back-log been tapped to any appreciable extent.

The sweeping victory of President Roosevelt was hardly expected even by the most enthusiastic of his supporters. It is too early to attempt to analyze what the effect of this will be on business. Probably what the President says and does in the next few weeks will have a most profound effect. In many ways the next month or two are perhaps the most critical since the dark days following the bank moratorium.

Chemical shipments as might be expected by the favorable state of most consuming industries were in heavy volume last month. Quite likely with the election out of the way the contract season will get under way at once.

Statistics of Business

	September 1936	September 1935	August 1936	August 1935	July 1936	July 1935
Automotive production	135,130	87,540	271,291	237,400	440,999	332.109
Bldg. contracts*‡	$234,270	$167,376	$275,281	$168,557	$294,834	$159.258
Failures, Dun & Bradstreet	586	787	655	884	639	902
Merchandise imports‡	$215,525	$161,647	$195.016	$169,030	$193,622	$176,631
Merchandise exports‡	$219,967	$198,803	$178,249	$172,128	$178,324	$173,230
Newsprint Production						
Canada, tons	269,782	223,892	270,053	235,573	274,627	234.266
U. S., tons	72,216	71,416	73,673	75,187	73,361	73,108
Newfoundland, tons	28,329	27,161	29,301	29,565	29,246	29,336
Plate Glass prod., sq. ft. ..	......	......	......	......	16,427,849	13,908,529
Steel ingots production, tons	4,161,000	2,825,000	4,195,130	2,915,930	3,922,000	2,267.000
Steel activity, % capacity ..	......	......	73.52	48.78	68.74	39.40
Pig iron production, tons..	2,992,968	1,978,411	2,711,721	1,761,286	2,594,000	1,520,000
U. S. consumption, crude rubber, tons	46,330	37,086	46,657	38,775	48,127	35,917
Tire shipments	......	......	4,967,383	4.739,259	5,743,863	5.447,109
Tire production	......	......	5,014,415	3,992.800	5,464.927	5.531,834
Tire inventory	......	......	7,793,438	7,805,054	7.746,388	8,849,503
Dept. of Labor Indices†						
Factory payrolls, totals† ..	81.0	71.7	81.0	69.6	77.8	78.7
Factory employment† ...	88.9	81.9	88.7	81.8	87.7	86.3
Chemical employment†*a* ..	119.3	108.0	115.8	107.7	115.3	109.0
Chemical payrolls†*a*	115.7	98.8	113.2	110.5	103.7	95.4
Chemicals and Related Products						
Exports‡	$9,642	$9,016	$9,186	$9,375	$9,081	$8,138
Imports‡	$5,840	$4,618	$5,333	$3,767	$5.752	$4,656
Stocks, mfg. goods	......	......	115	114	115	117
Stocks, raw materials ...	......	......	75	79	69	78
Anthracite shipments, tons	......	......	2,917,377	2,393,145	3.345,309	3,031,987
Bituminous prod., tons ...	......	......	32,818,000	26,164,000	32,054,000	22,252,000
Boot and shoe production ..	40,097,430	33,909,182	40,860,584	37,243,414	34,867,859	32.274,469

Week Ending	Carloadings 1936	Carloadings 1935	Carloadings % of Change	Electrical Output§ 1936	Electrical Output§ 1935	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices: Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	All Groups	‡‡Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
Sept. 26	807,070	629,835	+28.1	2,157,278	1,857,470	+16.1	81.6	95.1	80.2	67.4	74.0	80.0	81.8	75.4	102.7	119.0
Oct. 3	819,126	705,974	+16.0	2,169,442	1,863,480	+16.4	82.0	96.2	79.3	68.1	74.0	80.1	81.7	75.3	102.4	119.0
Oct. 10	820,195	734,154	+11.7	2,168,487	1,867,127	+16.1	82.1	96.2	79.4	67.8	74.0	80.2	81.7	75.9	102.5	119.3
Oct. 17	826,155	732,304	+12.8	2,170,127	1,863,086	+16.5	81.6	96.2	79.4	67.9	74.6	80.1	81.9	74.2	102.3	119.2
Oct. 24	815,972	710,621	+14.8	2,166,656	1,895,817	+14.3	80.9	96.2	80.4	67.8	74.6	79.9	82.3	74.3	101.1	119.1
Oct. 31	......	......	....	....	....	....	81.4	96.2	78.8	67.9	74.6	80.0	....	....	....	118.3

* 37 states; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; ‡ 000 omitted; § K.W.H., 000 omitted; *a* Includes all allied products but not petroleum refining; ‡‡ 1926-1928 = 100.0; *y* Preliminary; *z* Revised.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1935 Average $1.21 - Jan. 1936 $1.19 - Oct. 1936 $1.19

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Acetaldehyde, drs, c-l, wgs lb.	...	.14	...	.14	...	.14
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kegs..lb.	.38	.43	.38	.43	.38	.43
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys lb.	.21	.25	.21	.25	.21	.25
drs, f.o.b. wks, frt allowed lb.	...	.15	...	...	...	...
Acetin, tech, drs lb.	.22	.24	.22	.24	.22	.24
Acetone, tks, f.o.b. wks, frt allowed lb.	...	.07	.07	.12	.11	.12
drs, c-l, f.o.b. wks, frt allowed lb.	...	.08	.08	.12	...	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls lb.	.06¾	.07	.06¾	.07	.06¾	.07
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	...	2.45	...	2.45	2.40	2.45
glacial, bbls, c-l, wks 100 lbs.	...	8.43	...	8.43	8.25	8.43
glacial, USP, bbls, c-l, wks 100 lbs.	...	12.43	...	12.43	12.25	12.43
Adipic, kgs, bbls lb.	...	.72	...	.72	...	.72
Anthranilic, refd, bbls lb.	.85	.95	.85	.95	.85	.95
tech, bbls lb.	...	.75	...	.75	...	.75
Battery, cbys, delv 100 lbs.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb kgs lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ton *a*	...	95.00	...	95.00	80.00	95.00
Broenner's, bbls lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 95%, cbys lb.	.53	.60	.53	.60	.53	.60
edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs lb.	...	.22	...	.22	...	.22
wks lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Camphoric, drs lb.	...	5.25	...	5.25	...	5.25
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks lb.	.03½	.05	.03½	.05	.03½	.05½
Chromic, 99¾%, drs, delv lb.	.14¾	.16¾	.14¾	.16¾	.13¾	.16¾
Citric, USP, crys, 230 lb bbls lb. *b*	.25	.26	.25	.29	.28	.29
anhyd, gran, bbls lb. *b*	...	.29	.29	.31	...	.31
Cleve's, 250 lb bbls lb.	.52	.54	.52	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.63	.65	.51	.65	.46	.53
99%, straw, LB, drs, wks, frt equal gal.	.73	.75	.68	.75	.64	.68
resin grade, drs, wks, frt equal gal.	.63	.65	.52	.65	.52	.55
Crotonic, drs lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs lb.	.11	.13	.11	.13	.11	.13
Fumaric, bbls lb.	...	.60	...	.60	...	.60
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls lb.	.65	.68	.65	.68	.65	.68
USP, bbls lb.	.70	.80	.70	.80	.70	.80
Gamma, 225 lb bbls, wks lb.	.80	.84	.80	.84	.77	.79
H, 225 lb. bbls, wks lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 10% sol. cbys lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.04½	.05	.04½	.05
22%, light refd, bbls lb.	.06½	.07	.06½	.07	.06½	.07
44%, light, 500 lb bbls lb.	.11½	.12	.11½	.12	.11½	.12
44%, dark, 500 lb bbls lb.	.09½	.10	.09½	.10	.09½	.10
50%, water white, 500 lb bbls lb.	...	.14½	...	.14½	...	...
USP X, 85%, cbys lb.	.45	.50	.45	.50	.45	.50
Laurent's, 250 lb bbls lb.	.46	.47	.46	.47	.36	.37
Linoleic, bbls lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs lb.	.29	.32	.29	.32	.29	.32
Malic, powd, kgs lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.35	...	1.35	...	1.35
tks, wks 100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks 100 lb.	...	1.45	...	1.45	...	1.45
tks, wks 100 lb.	...	1.20	...	1.20	...	1.20
22°, c-l, cbys, wks 100 lb.	...	1.95	...	1.95	...	1.95
tks, wks 100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.11	.14	.11	.14	.11	.14
Sludges, drs lb.	.06	.10	.06	.10	...	...
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. lb.	.11½	.12½	.11½	.12½	.11½	.12½
Phosphoric, 50%, USP, cbys lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks lb.	.09	.10½	.09	.10½	.09	.10½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks lb.	.30	.40	.30	.40	.30	.40
Propionic, 98% wks, drs lb.	...	.35	...	.35	...	.35
80% lb.	.15	.17½	.15	.17½	.15	.17½
Pyrogallic, crys, kgs, wks lb.	1.55	1.65	1.55	1.65	1.55	1.65
Salicylic, tech, 125 lb bbls, wks lb.	...	.40	...	.40	...	.40
Sebacic, tech, drs, wks lb.	...	.58	...	.58	...	.58
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	.18	.19	.18	.19	.18	.19
Sulfuric, 60°, tks, wks ton	...	11.00	...	11.00	...	11.00
c-l, cbys, wks 100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks ton	...	15.50	...	15.50	...	15.50
c-l, cbys, wks 100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls lb.	.19	.36	.19	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls lb.	...	.24	...	.24	.24	.25
Tobias, 250 lb bbls lb.	.70	.72½	.70	.72½	.70	.80
Trichloroacetic bottles lb.	2.45	2.75	2.45	2.75	2.45	2.75
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	1.50	1.60	1.50	1.60	1.50	1.60
Vanadic, drs, wks lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls lb.	.50	.60	.50	.60	.45	.60
dark, bbls lb.	.12	.17	.12	.17	.12	.17
egg, edible lb.	.78	1.05	.77	1.05	.85	1.05
vegetable, edible lb.	.65	.70	.65	.70	.65	.70
ALCOHOLS						
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.143	...	.143	...	...
c-l, drs, delv lb.	...	.150	...	.150	...	...
lcl, drs, delv lb.	...	.157	...	.157	...	...
Amyl, secondary, tks, delv lb.	...	.108	...	.108	...	.108
Benzyl, bottles lb.	.65	1.10	.65	1.10	.65	1.10
Butyl, normal, tks, f.o.b. wks, frt allowed lb. *d*	...	.08½	.08½	.11	.11	.12
c-l, drs, f.o.b. wks, frt allowed lb. *d*	...	.09½	.09½	.12	.12	.13
Butyl, secondary, tks, delv lb. *d*	...	.07½	.07½	.096	...	.096
c-l, drs, delv lb. *d*	...	.08½	.08½	.106	...	.106
Capryl, drs, tech, wks lb.	...	.85	...	.85	...	.85
Cinnamic, bottles lb.	2.50	3.65	2.50	3.65	3.25	3.65
Denatured, CD, No. 11, 12, 13, tks, c-l, drs, wks gal. *e*	...	.30	.30	.44*	.34	.49*
Western schedule, c-l, wks gal. *e*	...	.39	.39	.52*	.38	.52*
Denatured, SD, No. 1, tks, c-l, tks	...	.26	.23	.28	.29½	.31
c-l, drs, wks gal. *e*	...	.29	.29	.34	.34½	.36
Diacetone, tech, tks, delv lb. *f*	...	.16	...	.16	...	.16
c-l, drs, delv lb. *f*	...	.17	...	.17	...	.17

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case; * Dealers were given 20% off this price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Alcohols (continued)						
Ethyl, 190 proof, molasses,						
tks ....gal. g	...	4.07	4.07	4.10	4.08½	4.10
c-l, drs ....gal. g	...	4.13	4.12	4.27	4.13½	4.27
c-l, bbls ....gal. g	...	4.14	4.13	4.28	4.15½	4.28
absolute, drs ......gal. g	4.54	6.08½	4.54	6.11½	4.55½	6.11½
Furfuryl, tech, 500 lb drs lb.	...	.35	...	.35	...	.35
Hexyl, secondary tks, delv						
....................lb.	...	.11½	...	.11½	...	.11½
c-l, drs, delv ....lb.	...	.12½	...	.12½	...	.12½
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	...
drs, lcl, delvd..........lb.	...	.27	...	.27	...	...
Isobutyl, refd, lcl, drs ..lb.	...	.10	.10	.12	.12	.60
c-l, drs ....lb.	...	.09½	.09½	.11½	...	...
tks ....lb.	...	.08½	.08½	.10½	...	...
Isopropyl, refd, c-l, drs,						
f.o.b. wks, frt allowed..lb.	...	.55	...	.55	...	.55
Propyl, norm, 50 gal drs gal.	...	.75	...	.75	...	.75
Special Solvent, tks, wks gal.	...	.24	.24	.32	...	...
Aldehyde ammonia, 100 gal						
drs ....lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb						
bbls ....lb.	.60	.65	.60	.65	.60	.65
Alphanaphthylamine, 350 lb						
bbls ....lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l,						
bbls, wks ....100 lb.	...	3.00	...	3.00	...	3.00
25 bbls or more, wks 100 lb.	...	3.15	...	3.15	...	3.15
less than 25 bbls, wks 100 lb.	...	3.25	...	3.25	...	3.25
Granular, c-l, bbls,						
wks ....100 lb.	...	2.75	...	2.75	...	2.75
25 bbls or more, wks 100 lb.	...	2.90	...	2.90	...	2.90
Powd, c-l, bbls, wks 100 lb.	...	3.15	...	3.15	...	3.15
25 bbls or more, wks 100 lb.	...	3.30	...	3.30	...	3.30
Chrome, bbls ....100 lb.	7.00	7.25	7.00	7.25	7.00	7.25
Potash, lump, c-l, bbls,						
wks ....100 lb.	...	3.25	...	3.25	...	3.25
25 bbls or more, wks 100 lb.	...	3.40	...	3.40	...	3.40
Granular, c-l, bbls,						
wks ....100 lb.	...	3.40	...	3.40	...	3.00
25 bbls or more, bbls,						
wks ....100 lb.	...	3.00	...	3.00	...	3.15
Powd, c-l, bbls, wks 100 lb.	...	3.40	...	3.40	...	3.40
25 bbls or more, wks 100 lb.	...	3.55	...	3.55	...	3.55
Soda, bbls, wks ....100 lb.	4.00	4.15	4.00	4.15	4.00	4.15
Aluminum metal, c-l, NY 100 lb.	19.00	20.00	19.00	20.00	19.00	23.30
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%, wks lb.	.07	.12	.07	.12	.07	.12
93%, wks ....lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks ..lb.	.06½	.07	.06½	.07	.06½	.07
Solution, drs, wks ..... lb.	.03	.03½	.03	.03½	.03	.03½
Hydrate, 96%, light, 90 lb.						
bbls, delv ....lb.	.13	.15	.13	.15	.13	.15
heavy, bbls, wks .....lb.	.04	.04½	.04	.04½	.04	.04½
Oleate, drs ....lb.	.16¾	.18½	.15¾	.18½	...	.15¼
Palmitate, bbls ....lb.	.21	.22	.21	.22	.20	.22
Resinate, pp., bbls .....lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ...lb.	.19	.21	.18	.21	.17	.20
Sulfate, com, c-l, bgs,						
wks ....100 lb.	...	1.35	...	1.35	...	1.35
c-l, bbls, wks .....100 lb.	...	1.55	...	1.55	...	1.55
Sulfate, iron-free, c-l, bgs,						
wks ....100 lb.	...	1.90	...	1.90	...	1.90
c-l, bbls, wks ....100 lb.	...	2.05	...	2.05	...	2.05
Aminoazobenzene, 110 lb kgs						
.......................lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks..lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.21½	.15¼	.21½	.15¼	.21½
26°, 800 lb drs, delv ....lb.	.02½	.03	.02½	.03	.02½	.03
Aqua 26°, tks, NH ..cont.	...	.05	...	.05	...	.05
tk wagon ....lb.	...	.024	...	.024	...	.024
Ammonium Acetate, kgs ..lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b.						
plant ....100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls ..lb.	.16	.17	.15	.17	.15	.17
carbonate, tech, 500 lb						
bbls ....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb						
bbls, wks ....100 lb.	4.45	4.90	4.45	4.90	4.45	4.90
Gray, 250 lb bbls, wks ..lb.	5.00	5.75	5.00	5.75	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Linoleate ....lb.	.11	.12	.11	.12	.11	.12
Nitrate, tech, cks ......lb.	.04	.05	.04	.05	.04	.05
Oleate, drs ....lb.	...	.10	...	.10	...	.10
Oxalate, neut, cryst, powd,						
bbls ....lb.	.26	.27	.26	.27	.26	.27
pure, cryst, bbls, kgs..lb.	.27	.28	.27	.28	.27	.28
Perchlorate, kgs ......lb.	...	.16	...	.16	...	.16
Persulfate, 112 lb kgs ..lb.	.21	.24	.21	.25	.22½	.25
Phosphate, dibasic tech,						
powd, 325 lb bbls ....lb.	.07½	.10	.07½	.10	.08	.10
Stearate, drs ....lb.	...	.26	...	...	...	...
Sulfate, dom, f.o.b., bulk ton	...	25.50	22.00	26.00	20.00	24.00
200 lb bgs ....ton	...	nom.	...	nom.	25.50	25.80
100 lb bgs ....lb.	...	nom.	...	nom.	26.00	26.50
Sulfocyanide, kgs ......lb.	...	.55	...	.55	...	.50
Amyl Acetate (from pentane)						
tks, delv ....lb.	...	.13½	...	.13½	...	.13½
tech, drs, delv ....lb.	.142	.149	.142	.149	.142	.149
secondary, tks, delv ..lb.	...	.108	...	.108	...	.108
c-l, drs, delv ....lb.	.118	.123	.118	.123	.118	.123
Amyl Chloride, norm drs, wks lb.	.56	.68	.56	.68	.56	.68
Chloride, mixed, drs, wks lb.	.07	.077	.07	.077	.07	.077
tks, wks ....lb.	...	.06	...	.06	...	.06
Mercaptan, drs, wks ....lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs....lb.	...	.25	...	...	...	...
Stearate, lcl, wks, drs...lb.	...	.26	...	...	...	...

g Grain alcohol 20c a gal. higher in each case.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.102	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and						
tks .... lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine ....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% ....lb.	...	.75	...	.75	...	.75
40% ....lb.	...	.18	...	.18	...	.18
Anthraquinone, sublimed, 125						
lb bbls ....lb.	.50	.52	.50	.52	.50	.52
Antimony metal slabs, ton						
lots ....lb.	...	.11¾	.11⅜	.13½	.12½	.16
Needle, powd, bbls .....lb.	.11½	.12	.11	.12½	.09	.13½
Butter of, see Chloride.						
Chloride, soln cbys .....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls ......lb.	.12¾	.13	.12¾	.14	.10¼	.15
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.22	.24
Sulfuret, golden, bbls...lb.	.22	.23	.22	.23	.19	.23
Vermilion, bbls ....lb.	.35	.42	.35	.42	.35	.42
Archil, conc, 600 lb bbls ..lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls .....lb.	.18	.20	.18	.20	.18	.20
Triple, 600 lb bbls .....lb.	.18	.20	.18	.20	.18	.20
Argols, 80%, casks ......lb.	.14	.15	.14	.15	.15	.16
Crude, 30%, casks .....lb.	.07	.08	.07	.08	.07	.08
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl ....lb.	.08¾	.09¾	.08¾	.09¾	.08¾	.09¾
Arsenic, Red, 224 lb cs kgs lb.	...	.15¾	...	.15¾	...	.15¾
White, 112 lb kgs ......lb.	.03½	.04½	.03½	.04½	.03½	.04½
Metal ....lb.	.42	.44	.40	.44	.40	.42
Asbestine, c-l, wks ....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate precip,						
200 lb bgs, wks .....ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat (witherite) 90% gr,						
c-l, wks, bgs ....ton	42.00	45.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs NY lb.	.15½	.17½	.15½	.17½	.14	.17½
Chloride, 600 lb bbl, wks ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.12
Hydrate, 500 lb bbls ....lb.	.05¼	.06	.05¼	.06	.05½	.06
Nitrate, bbls ....lb.	...	.07	.07	.08¼	...	.08¼
Barytes, floated, 350 lb bbls						
wks ....ton	23.65	31.15	23.65	31.15	23.00	31.15
Bauxite, bulk, mines .....ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, No. 1, bgs,						
wks ....ton	...	16.50	...	16.50	16.50	18.00
No. 2 ....ton	...	11.00	...	11.00	11.00	12.50
Benzaldehyde, tech, 945 lb						
drs, wks ....lb.	.60	.62	.60	.62	.60	.62
Benzene (Benzol), 90%, Ind,						
8000 gal tks, frt allowed						
.....................gal.	...	.16	.16	.18	.15	.18
90% c-l, drs ....gal.	...	.23	...	.23	.23	.24
Ind Pure, tks, frt allowed						
.....................gal.	...	.16	.16	.18	.15	.18
Benzidine Base, dry, 250 lb						
bbls ....lb.	.72	.74	.72	.74	.67	.69
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs..lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl,						
wks ....lb.	.24	.27	.24	.27	...	.24
Naphthylamine, sublimed,						
200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ......lb.	.53	.55	.53	.55	.53	.55
Bismuth metal	1.00	1.10	1.00	1.10	.90	1.20
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes ......lb.	3.15	3.20	3.15	3.20	3.15	3.20
Oxychloride, boxes .....lb.	2.95	3.00	2.95	3.00	2.95	3.00
Subbenzoate, boxes .....lb.	3.25	3.30	3.25	3.30	3.25	3.30
Subcarbonate, kgs ......lb.	1.40	1.45	1.40	1.45	1.55	1.70
Trioxide, powd, boxes...lb.	3.45	3.50	3.45	3.50	3.45	3.50
Subnitrate	1.30	1.35	1.30	1.35	1.30	1.45
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls,						
wks ....ton h	42.50	70.00	42.50	70.00	42.50	70.00
Bleaching Powder, 800 lb drs,						
c-l, wks, contract..100 lb.	...	2.00	...	2.00	1.90	2.00
lcl, drs, wks ....lb.	2.25	3.60	2.25	3.60	2.15	3.60
Blood, dried, f.o.b., NY..unit	...	3.75	2.50	4.25	2.50	3.25
Chicago, high grade ...unit	...	3.75	2.90	4.50	2.50	3.75
Imported shipt ....unit	3.45	3.50	2.60	3.60	2.75	3.30
Blues, Bronze Chinese Milori						
Prussian Soluble .....lb.	.37	.38½	.37	.38½	.36½	.38
Ultramarine,* dry, wks,						
bbls ....lb.	...	.10	...	.10	...	...
Regular grade, group 1 lb.	...	.15	...	.15	...	...
Special, group 1.......lb.	...	.18	...	.18	...	...
Pulp, No. 1 ....lb.	...	.26	...	.26	...	...
Bone, 4½ + 50% raw,						
Chicago ....ton	23.00	25.00	20.00	25.00	19.00	22.00
Bone Ash, 100 lb kgs .....lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ......lb.	.05½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp..ton	...	24.75	23.00	25.00	22.75	24.00
Domestic, bgs, Chicago..ton	...	18.00	16.00	20.00	16.00	21.00
Borax, tech, gran, 80 ton lots,						
sacks, delv ....ton i	...	40.00	...	40.00	36.00	40.00
bbls, delv ....ton i	...	50.00	...	50.00	46.00	50.00
c-l, sacks, delv ....ton i	...	44.00	...	44.00	40.00	44.00
c-l, bbls, delv ....ton i	...	54.00	...	54.00	50.00	54.00
Tech, powd, 80 ton lots,						
sacks ....ton i	...	45.00	...	45.00	41.00	45.00
bbls, delv ....ton i	...	56.00	...	56.00	51.00	56.00
c-l, sacks, delv ....ton i	...	49.00	...	49.00	45.00	49.00
c-l, bbls, delv ....ton i	...	59.00	...	59.00	55.00	59.00
Bordeaux Mixture, jobbers,						
East, c-l, tins, drs, cases lb.	.08	.16	.08	.16	.08	.16
Jobbers, West, c-l ......lb.	.08	.10	.08	.10	.08	.10
Dealers, East, c-l ......lb.	.08½	.16½	.08½	.16½	.08½	.16½
Dealers, West, c-l ......lb.	.09	.11	.09	.11	.09	.11

h Lowest price is for pulp, highest for high grade precipitated; i Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Bromine, cases ....lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk ....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks ....lb.	...	.04	...	.04	...	.04
Butyl, Acetate, norm drs, frt allowed ....lb.	.09½	.10	.09½	.12½	.12	.13½
tks, frt allowed ....lb.	...	.08½	.08½	.11	.11	.13
Secondary, tks, frt allowed ....lb.	...	.07½	.07½	.096	...	.096
drs, frt, allowed .....lb.	.08½	.09	.106	.111	.106	.111
Aldehyde, 50 gal drs, wks ....lb.	.19	.21	.19	.21	.19	.21
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Lactate, drs ....lb.	.22½	.23½	.22½	.23½	.22½	.23½
Propionate, drs ....lb.	.18	.18½	.18	.18½	.18	.18½
tks, delv ....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	...	.26	...	.26	...	.26
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	...	...	...
Cadmium, Sulfide, boxes...lb.	.90	1.00	.90	1.10	.75	.85
Cadmium Metal ....lb.	...	1.05	.75	1.05	.55	.90
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	2.10	...	2.10	2.00	2.10
Arsenate, jobbers, East of Rocky Mts, drs ......lb.	.06	.06⅜	.06	.06⅜	.06	.06½
dealers, drs ....lb.	.06¼	.07¾	.06¼	.07¾	.06¼	.07¾
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	.06	.06½
dealers, drs ....lb.	.06½	.06¾	.06½	.06¾	.06¼	.06¾
Carbide, drs ....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs, c-l, wks ....ton	...	19.50	...	19.50	...	19.50
Solid, 650 lb drs, c-l, f.o.b. wks ....ton	...	17.50	...	17.50	...	17.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls ....lb.	.50	.57	.50	.57	...	...
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls ....lb.	.21	.22	.21	.22	.20	.22
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls ...lb.	.19	.21	.18	.21	.17	.20
Camphor, slabs ....lb.	...	.52	.50	.56	.49	.57
Powder ....lb.	...	.52	.4940	.56	.50	.57
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	...	.07
cartons, delv ......lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv ....lb.	...	.08¼	...	.08¼	...	.08¼
Bisulfide, 500 lb drs ....lb.	.05¼	.08	.05¼	.08	.05¼	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv ....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom, grd lb.	.17	.18¼	.14½	.18¾	.09½	.16¾
80-100 mesh, c-l, bgs....lb.	.17½	.18¼	.15	.19¾	.10	.17¼
Castor Pomace, 5½ NH_3, c-l, bgs, wks ....ton	...	18.50	15.00	18.50	16.00	18.50
Imported, ship, bgs ....ton	...	17.00	17.00	18.00	17.25	20.00
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.17	.18
Transparent, cs ....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs ....lb.	.55	.60	.55	.60	.55	.60
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks ....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	...	.15
Willow, powd, 100 lb bbl, wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv* ....ton	24.40	25.40	24.40	25.40	22.40	30.00
Chestnut, clarified bbls, wks lb.	...	.01625	.01625	.01⅞	...	.01⅞
25%, tks, wks ....lb.	...	.02	.01½	.02	...	.01½
Pwd, 60%, 100 lb bgs. wks ....lb.	...	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	...	7.00
Powdered, bbls ....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls, wks ..ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks, contract ....lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract ...lb. j	...	.05½	...	.05½	...	.05½
Liq, tk, wks, contract 100 lb.	...	2.15	...	2.15	2.00	2.15
Multi, c-l, cyls, wks, cont ....lb.	2.30	2.55	2.30	2.55	2.30	2.40
Chloroacetophenone, tins, wks ....lb.	...	2.00	...	2.00	..	2.00
Chlorobenzene, Mono, 100 lb drs, lcl, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs .... lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ....lb.	.30	.31	.30	.31	.30	.31
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	.90
Chrome, Green, CP ......lb.	.18½	.21½	.21½	.21½	.17	.30
Yellow ....lb.	.12	.13	.11	.13	.11	.16
Chromium, Acetate, 8% Chrome, bbls ....lb.	.06	.08	.06	.08	.05	.05¾
20° soln, 400 lb bbls .. lb.	...	.05½	...	.05½	..	.05½
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price; * **Depends upon point of delivery.**

Current

Coal Tar
Diphenylguanidine

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Coal tar, bbls ....bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls ......lb.	...	.58	.58	.60	...	.60
Carbonate tech, bbls ....lb.	1.42¾	1.48	1.35	1.48	1.35	1.40
Hydrate, bbls ....lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ...lb.	...	.31¼	.30	.31¼	...	.30
Resinate, fused, bbls ...lb.	...	.13	.12½	.13	...	.12½
Precipitated, bbls ......lb.	...	.32	...	.32	...	.32
Oxide, black, bgs ......lb.	1.41	1.51	1.29	1.49	1.25	1.49
Cochineal, gray or bk bgs..lb.	.32	.36	.32	.36	.32	.39
Teneriffe silver, bgs ....lb.	.33	.37	.33	.37	.33	.40
Copper, metal, electrol 100 lb.	...	10.25	9.50	10.25	8.00	9.25
Carbonate, 400 lb bbls ..lb.	...	.08¼	...	.08¼	...	.08¼
52-54% bbls ....lb.	.14½	.16¼	.14½	.16¼	.14½	.16¼
Chloride, 250 lb bbls ...lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs ....lb.	.37	.38	.37	.38	.37	.38
Oleate, precip, bbls .....lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls..lb.	.14	.15	.14	.15	.15	.17
black bbls, wks ......lb.	.14¾	.15¾	.14½	.15¾	.14	.16½
Resinate, precip, bbls ...lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls ...lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.00	3.85	4.00	...	3.85
Copperas, crys and sugar bulk c-l, wks, bgs ....ton	14.00	16.00	13.00	16.00	12.00	14.00
Corn Syrup, 42 deg, bbls 100 lb.	...	3.80	3.05	3.95	3.18	3.63
43 deg, bbls .....100 lb.	...	3.90	3.10	4.05	3.23	3.68
Corn Sugar, tanners, bbls 100 lb.	3.78	3.88	3.08	4.03	3.46	3.66
Cotton, Soluble, wet, 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls .....lb.	...	.16¼	.16¼	.16¾	.16¼	.17¼
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ......gal.	.12½	.13½	.12½	.13½	.11½	.13½
Grade 2 ....gal.	.113	.12½	.109	.12	.10½	.12
Cresol, USP, drs ....lb.	.10	.10½	.10	.10½	.10	.11½
Crotonaldehyde, 98%, drs, wks ....lb.	.26	.30	.26	.30	.32	.36
Cudbear, English ....lb.	.19	.25	.19	.25	.19	.25
Cutch, Philippine, 100 lb bale lb.	.04	.04¾	.04	.04¾	.03½	.04¾
Cyanamid, bgs, c-l, frt allowed Ammonia unit	...	1.07½	...	1.07½	...	1.07½
Derris root 5% rotenone, bbls ....lb.	.39	.47	...	...	...	...
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	4.35	4.55	3.45	5.00	3.60	4.15
British Gum, bgs ...100 lb.	4.60	4.80	3.70	5.40	3.85	4.50
White, 140 lb bgs ..100 lb.	4.30	4.50	3.40	4.95	3.50	4.10
Potato, Yellow, 220 lb bgs lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl..lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ....lb.	...	.08	...	.08	.08	.08¾
Diamylamine, drs, wks ...lb.	...	.75	.75	1.00	...	1.00
Diamylene, drs, wks ......lb.	.095	.102	.095	.102	.095	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.085	.092
tks, wks ....lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks...lb.	...	.30	...	...	...	...
Diamylphthalate, drs wks gal.	.19	.19½	.18	.19½	.18	.20½
Diamyl Sulfide, drs, wks ..lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls ....lb.	2.25	2.45	2.25	2.45	2.25	2.45
Dibutyl Ether, drs, wks, lcl lb.	...	.22	...	...	...	...
Dibutylphthalate, drs, wks, frt allowed ....lb.	...	.18	.18	.21	.20	.23
Dibutyltartrate, 50 gal drs lb.	.35	.40	.35	.40	.35	.40
Dichlorethylene, drs .....gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks ....lb.	.16	.17	.16	.17	.16	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	...	.23	.15	.23
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.032	.040
tks, wks ....lb.	...	.02½	...	.02½	...	.02½
Diethanolamine, tks, wks..lb.	...	.30	...	.30	...	...
Diethylamine, 400 lb drs ..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs .....lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅛	.35	.31⅛	.35	.31⅛	.35
90% grade, drs ....lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs..lb.	.52	.55	.52	.55	.52	.55
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs lb.	.18½	.19	.18½	.19	.18½	.27
Diethylsulfate, tech, drs, wks, lcl ....lb.	...	.20	...	.20	...	...
Diethyleneglycol, drs .....lb.	.16½	.17½	.15½	.17½	.15½	.17½
Mono ethyl ethers, drs..lb.	.16	.17	.15	.17	.15	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Mono butyl ether, drs ..lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.27
Diglycol Oleate, bbls ..... lb.	...	.24	...	.24	.16	.24
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	...	.95	...	.95	...	.95
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.29	.30
Dimethyl Ethyl Carbinol, drs lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt allowed ....lb.	.19½	.20	.19½	.21½	.20½	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb. *k*	.17	.19½	.17	.19½	.17	.19½
Dinitrochlorobenzene, 400 lb bbls ....lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15½	.16½
Diphenyl ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.31	.32	.31	.32
Diphenylguanidine, 100 lb bbl ....lb.	.35	.37	.35	.37	.36	.37

k Higher price is for purified material.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ....ton	32.00	35.00	32.00	45.00	36.00	40.00
Extract ....lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, dom., 200 lb cases ....lb.	...	.68	.63	.68	.46	.63
Imported ....lb.	.51	.53	.48	.56	...	...
Epsom Salt, tech, 300 lb bbls c-l NY ....100 lb.	1.80	2.00	1.80	2.00	1.80	2.25
USP, c-l, bbls ....100 lb.	...	2.00	...	2.00	2.00	2.25
Ether, USP anaesthesia 55 lb drs ....lb.	.22	.23	.22	.23	.22	.23
(Conc) ....lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed ....lb.	...	.06	...	.06	...	.06
Nitrous, conc, bottles ....lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs ....lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt alld ....lb.	...	.06½	.06½	.08	.07½	.08
drs, frt alld ....lb.	...	.07½	.07½	.09	.08½	.09
Anhydrous, tks, frt alld ..lb.	...	.07½	.07	.08½	...	.08½
drs, frt alld ....lb.	...	.08½	.08	.10	.09½	.10
Acetoacetate, 110 gal drs lb.	...	.37	.37	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drs ....lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs ....lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys ....lb.	...	.30	...	.30	...	.30
Crotonate, drs ....lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs ....lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks ....lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs, frt allowed ....lb.	.07½	.08	.07½	.09	.08½	.09
tks, frt allowed ....lb.	...	.06½	.06½	.07½	...	.07½
Oxalate, drs, wks ....lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs, wks ....lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb drs ....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous ....lb.	...	.75	...	.75	...	...
Dichloride, 50 gal drs, wks ....lb.	.0545	.0994	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks lb.	.17	.21	.17	.21	.17	.28
tks, wks ....lb.	...	.16	...	.16	...	...
Mono Butyl Ether, drs. wks ....lb.	.20	.21	.20	.21	.20	.21
tks, wks ....lb.	...	.19	...	.19	...	.19
Mono Ethyl Ether, drs, wks ....lb.	.16	.17	.16	.17	.16	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks ....lb.	...	.14	.14	.18½	.17½	.18½
tks, wks ....lb.	...	.13	.13	.16½	...	.16½
Mono, Methyl Ether, drs wks ....lb.	.19	.23	.19	.23	.19	.23
tks, wks ....lb.	...	.18	...	.18	...	...
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl ....lb.	.50	.55	.50	.60	.55	.75
Ethylidenaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ....ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks ....ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls ....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground, wks ....unit *l*	...	3.35	2.50	3.25	2.25	2.90
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m*	31.00	nom.	...	2.25	2.00	2.35
Fluorspar, 98%, bgs ....lb.	30.00	35.50	30.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb bbls, wks ....lb.	.06	.07	.06	.07	.06	.07
Fossil Flour ....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ....ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs ....ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks ..lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs ....lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips ....lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes ...lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls ..lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes ....lb.	.16	.18	.16	.18	.16	.18
Sticks ....ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls ...lb.	.45	.47	.45	.47	.42	.43
Gall Extract ....lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs ..lb.	...	.06	...	.06	.05	.08
Singapore cubes, 150 lb bgs ....100 lb.	.08	.09	.08	.09	.07⅛	.09⅛
Gelatin, tech, 100 lb cs .. lb.	.50	.55	.50	.55	.50	.55
Glauber's Salt, tech, c-l, wks ....100 lb.	1.10	1.30	1.10	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glue, bone, com grades, c-l bgs ....lb.	.10½	.17½	.10½	.17½	...	...
Better grades, c-l, bgs lb.	.12	.17½	.12	.17½	...	...
Casein, kgs ....lb.	.18	.22	.18	.22	.18	.22
Glycerin, CP, 550 lb drs ..lb.	...	.21½	.16	.21½	.14	.14½
Dynamite, 100 lb drs .. lb.	...	.21½	.13¾	.21½	.13¾	.14¼
Saponification, drs ....lb.	...	.19	.10¼	.19	.10	.11½
Soap Lye, drs ....lb.	...	.16¾	.09¼	.16¾	.09	.10

l + 10; *m* + 50.

Current

**Glyceryl Phthalate
Gum, Hemlock**

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Glyceryl Phthalate ....lb.	...	.29	.28	.29	....	.28
Glyceryl Stearate, bbls....lb.	...	.18	...	.18	...	.18
Glycol Phthalate ....lb.	...	.35	.29	.35	.28	.29
Glycol Stearate ....lb.	...	.23	...	.23	.18	.23
Graphite:						
Crystalline, 500 lb bbls..lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls .....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls ....lb.	.03	.04	.03	.04	.03	.04
GUMS						
Gum Aloes, Barbadoes ....lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts ......lb.	.09¼	.09½	.09	.10¾	.09½	.15
White sorts, No. 1, bgs..lb.	.27	.28	.25	.28	.21	.27
No. 2, bgs ....lb.	.25	.26	.24	.26	.19	.26
Powd, bbls ....lb.	.13	.14	.13	.14	.13¼	.18
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY ....lb.	.02½	.10½	.02½	.10½	.02½	.10½
Egyptian, 200 lb cases, f.o.b., NY ....lb.	.12	.15	.12	.15	.12	.15
California, f.o.b., NY, drs ....ton	29.00	55.00	29.00	55.00	29.00	55.00
Benzoin Sumatra, USP, 120 lb cases ....lb.	.16	.17	.15	.19	.19	.28
Copal, Congo, 112 lb bgs, clean, opaque ....lb.	...	.19½	.18½	.20	.19½	.24⅝
Dark amber ....lb.	...	.07	.07	.08	.07¼	.09¼
Light amber ....lb.	...	.11¼	.11¼	.14⅛	.11½	.14⅞
Copal, East India, 180 lb bgs						
Macassar pale bold ....lb.	.12⅝	.13¼	.12⅝	.14	.09½	.10¾
Chips ....lb.	.06⅛	.06½	.06⅛	.06½	.05½	.06
Nubs ....lb.	...	.11⅛	.10⅞	.11⅛	...	...
Dust ....lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.04½
Singapore						
Bold ....lb.	...	.15½	.15⅛	.16⅞	.12⅛	.17
Chips ....lb.	...	.04⅜	.04⅜	.05¼	.04⅝	.05⅝
Nubs ....lb.	...	.10	.10	.11¼	.10	.11¾
Dust ....lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.05½
Copal Manilla, 180-190 lb baskets, Loba A .....lb.	...	.10¾	.10¾	.13	.11¾	.13
Loba B ....lb.	...	.09⅞	.09⅞	.12	.10¼	.12
Loba C ....lb.	...	.09⅜	.09⅜	.11⅛	.10⅜	.11½
MA sorts ....lb.	...	.06¾	.06¾	.07⅝	.06	.07⅝
DBB ....lb.	.08	.08⅞	.08	.08⅞	.08	.09
Dust ....lb.	...	.05¼	.05¼	.06⅛	.04⅞	.06⅛
Copal Pontianak, 224 lb cases, bold genuine ....lb.	14¼	.14¾	.14¼	.16	.14⅜	.16⅝
Mixed ....lb.	.13¼	.13¾	.13¼	.13¾	.12⅞	.14⅞
Chips ....lb.	..	.07¾	.07	.07⅞	.06⅞	.08¼
Nubs ....lb.	10¼	.10½	.10¼	.10½	.09⅝	.11¾
Split ....lb.	12⅞	.13	.12⅞	.13	.12⅜	.13⅞
Dammar Batavia, 136 lb cases						
A ....lb.	.21¾	.22¼	.21⅜	.22¼	.19	.21⅞
B ....lb.	.20¾	.21½	.20⅜	.21½	.18	.20⅞
C ....lb.	...	.16⅝	.16½	.17⅝	.16	.17
D ....lb.	.14¼	.14⅜	.13⅝	.14⅜	.11¾	.14⅛
A/D ....lb.	...	.16¾	.15½	.17	.14	.16
A/E ....lb.	...	.12⅞	.12⅞	.14¼	.11¾	.13¾
E ....lb.	.06¾	.07¼	.06¾	.07¼	.07	.07¾
F ....lb.	.06⅜	.06⅞	.06⅜	.06⅞	.06⅛	.06⅞
Singapore						
No. 1 ....lb.	.16¼	.16⅞	.16¼	.17½	.15⅝	.19
No. 2 ....lb.	.13¾	.14¼	.13¾	.14¼	.10⅝	.14⅞
No. 3 ....lb.	.05¼	.05¾	.05¼	.05¾	.04⅝	.05⅞
Chips ....lb.	...	.09¾	.09¾	.09¾	.08⅞	.09¾
Dust ....lb.	...	.04¾	.04¼	.05⅝	.04¾	.05⅞
Seeds ....lb.	...	.07⅜	.06⅝	.07⅜	.04¾	.07¼
Elemi, cons ....lb.	.09¾	.10¼	.09¾	.10¼	...	...
Ester ....lb.	.07¾	.08¼	.07⅝	.08⅜	.07¼	.08⅜
Gamboge, pipe, cases .....lb.	.58	.59	.58	.59	,55	.65
Powd, bbls ....lb.	.65	.66	.65	.66	.65	.75
Ghatti, sol. bgs ....lb.	.11	.15	.11	.15	.09	.15
Karaya, powd, bbls, xxx..lb.	.24	.25	.24	.25	.23	.25
xx ....lb.	.16	.17	.16	.17	.15	.17
No. 1 ....lb.	.09½	.10	.09½	.10	.08	.10
No. 2 ....lb.	.08½	.09	.08½	.09	.07	.09
Kauri, NY, San Francisco, Brown XXX, cases ....lb.	.60	.60½	.60	.60½	.60	.60½
BX ....lb.	.33	.33½	.33	.33½	.33	.33½
B1 ....lb.	...	.21	.19	.21	.19	.19½
B2 ....lb.	...	.15½	.14½	.15½	.14½	.15
B3 ....lb.	.12	.12½	.12	.12½	.12	.12½
Pale XXX ....lb.	.65	.65½	.65	.65½	.65	.65½
No. 1 ....lb.	.40	.40½	.40	.40½	.40	.40½
No. 2 ....lb.	.22	.22½	.22	.22½	.22	.22½
No. 3 ....lb.	.15	.15½	.15	.15½	.15	.15½
Kino, tins ....lb.	.70	.80	.70	.80	.70	.80
Mastic ....lb.	.57	.58	.56	.60½	.46	.60½
Sandarac, prime quality, 200 lb bgs & 300 lb cks ...lb.	.27	.38	.19½	.38	.26¼	.35½
Senegal, picked bgs ......lb.	.20	.21	.20	.21	.20	.21
Sorts ....lb.	.09¾	.10¼	.09¾	.12½	.09⅜	.12½
Thus, bbls ....280 lbs.	...	11.50	11.00	11.50	10.50	11.00
Strained ....280 lbs.	...	11.50	11.00	11.50	10.50	11.00
Tragacanth, No. 1, cases..lb.	...	1.95	1.20	1.95	1.15	1.30
No. 2 ....lb.	1.65	1.70	1.10	1.70	1.05	1.20
No. 3 ....lb.	1.50	1.55	.95	1.55	.95	1.05
No. 4 ....lb.	1.40	1.45	.85	1.45	.85	.95
No. 5 ....lb.	1.30	1.35	.75	1.35	.75	.85
No. 6, bgs ....lb.	.30	.31	.18	.31	.14	.19
Sorts, bgs ....lb.	.30	.35	.25	.30	.11	.25
Yacca, bgs ....lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.03¾
Helium, cyl (200 cu. ft.) cyl.	...	25.00	...	25.00	...	25.00
Hematite crystals, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Paste, 500 bbls ....lb.	...	.11	...	.11	...	.11
Hemlock, 25%, 600 lb bbls, wks ....lb.	...	.02⅞	...	.02⅞	...	.02⅞
tks ....lb.	...	.02½	...	.02½	...	.02½

	Current	Market	1936 Low	1936 High	1935 Low	1935 High
Hexalene, 50 gal drs, wks lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C. Group 3, tks ....gal.	...	.12	...	.12	...	.14
Hexamethylenetetramine, powd, drs ....lb.	.37	.39	.37	.39	.37	.39
Hexyl Acetate, delv, drs ..lb.	.12	.12½	.12	.12½	.12	.12½
tks ....lb.	...	.11½	...	.11½	...	.11½
Hoof Meal, f.o.b. Chicago unit	2.75	2.85	2.35	3.00	2.50	2.70
Hydrogen Peroxide, 100 vol, 140 lb cbys ....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo, Madras, bbls .....lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs ....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ....lb.	.13	.14	.13	.14	...	.12
Iodine, Resublimed, kgs...lb.	1.50	1.55	1.50	1.75	...	1.90
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.09	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.18	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English ....lb.	.07½	08¾	.07½	.08¾	.07½	.08¾
Isobutyl Carbinol (128-132°C) drs, wks ....lb.	.33	.34	.33	.34	.33	.34
tks, wks ....lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt allowed ....lb.	...	.06½	.06	.07½	...	.07½
drs, frt allowed ....lb.	.07½	.08	.07	.09	.08½	.09
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY, Brown ....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken, f.o.b. NY, bbls ......lb.	...	.09½	...	.09½	...	.09½
White, broken, bbls ..lb.	...	.11	...	.11	...	.11
cryst, bbls ....lb.	...	.10½	...	.10½	...	.10½
gran, bbls ....lb.	...	.11	...	.11	...	.11
powd, bbls ....lb.	...	.11¼	...	.11¼	...	.11¼
Arsenate, East, jobbers, drs ....lb.	.09	.09⅜	.09	.09⅜	.09	.09½
Dealers, drs ....lb.	.09¼	.10¾	.09¼	.10¾	.09¼	.10¾
West, jobbers, drs ..lb.	...	.09	...	.09	...	.09
Dealers, drs .....lb.	...	.10	...	.10	...	.10
Linoleate, solid, bbls ...lb.	...	.18	.18	.26½	.26	.26½
Metal, c-l, NY .....100 lb.	...	4.85	4.50	4.85	3.50	4.50
Red, dry, 95% Pb_2O_4, delv ....lb.	.0730	.0755	.07	.08	.06	.08
97% Pb_2O_4, delv .....lb.	.0755	.0780	.07¼	.08¼	.06¼	.08¼
98% Pb_2O_4, delv .....lb.	.0780	.0805	.07½	.08½	.06½	.08½
Nitrate, 500 lb bbls, wks lb.	.09	.09½	.09	.09½	.10	.14
Oleate, bbls ....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	...	.14
Stearate, bbls ....lb.	.22	.23	.22	.23	.22	.23
Titanate, bbls, c-l, f.o.b. wks, frt allowed......lb.	...	.10	...	...	...	...
White, 500 lb bbls, wks..lb.	.06½	.07	.06½	.07	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06	...	.06	...	.06
Lime, chemical quicklime, f.o.b., wks, bulk .....ton	7.00	7.25	7.00	7.25	7.00	7.25
Hydrated, f.o.b., wks ..ton	9.00	12.00	8.50	12.00	8.50	12.00
Lime Salts, see Calcium Salts.						
Lime sulfur, dealers, tks..gal.	...	.11	...	.11	.10½	.11
drs ....gal.	.13	.16	.13	.16	.13	.16½
Dry, bgs, jobbers.......lb.	.07¼	.10¼	.07¼	.10¼	...	...
Linseed Meal, bgs ....ton	...	40.50	29.00	40.50	25.50	40.00
Litharge, coml, delv, bbls..lb.	.0630	.0655	.06	.07	.05	.07
Lithopone, dom, ordinary, delv, bgs ....lb.	.04½	.04¾	.04½	.04¾	.04½	.04¾
bbls ....lb.	.04¾	.05	.04¾	.05	.04¾	.05
High strength, bgs .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Titanated, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	,06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.06½	.10¼	.06½	.10½	.08½	.10½
Solid, 50 lb boxes .....lb.	.13½	.17½	.13½	.17½	.13½	.17½
Sticks ....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	60.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs, c-l, wks ....ton	36.00	39.00	36.00	39.00	36.00	39.00
Magnesium fluosilicate, crys, 400 lb bbls, wks .....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls ....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls ...lb.	...	.50	...	.50	...	.50
Palmitate, bbls ....lb.	.23	.24	.23	.24	.22	.24
Stearate, bbls ....lb.	.21	.24	.20	.24	.19	.22
Linoleate, lig drs ......lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls ....lb.	...	.12	...	.12	...	.12
Manganese Borate, 30%, 200 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.09	.12
Dioxide, tech (peroxide), paper bgs, c-l ....ton	...	47.50	...	47.50	45.00	50.00
Sulfate, tech, anhyd, 90-95%, 550 lb drs......lb.	...	.07¼	...	...	...	...
Mangrove, 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African ....ton	...	25.50	25.50	27.00	26.00	30.00
Mannitol, pure cryst, cs, wks ....lb.	...	1.48	1.48	1.60	...	...
Marble Flour, blk ....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride ....lb.	...	1.14	.81	1.14	.71	.93
Mercury metal ...76 lb. flasks	92.00	9400	73.50	94.00	69.00	77.00
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.40	1.55	1.40	1.55	1.40	1.55

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Meta-phenylene-diamine 300 lb bbls ....lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs .....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls .....lb.	.09	.10	.09	.10	.09	.10
Stearate, bbls ....lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb bbls ....lb.	.67	.69	.67	.69	.67	.69
Methanol, 95%, frt allowed, drs ....gal. o	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed ....gal. o	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal. o	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed ....gal. o	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal. o	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. o	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed, drs ....gal. o	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. o	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-100%, drs ....lb.	.16	.17½	.11	.18½	.18	.18½
Synthetic, 410 lb drs ...lb.	.16	.17	.16	.17	.16	.17
tks ....lb.	...	.15	...	.15	...	.15
Acetone, frt allowed, drs ....gal. p	.45½	.58½	.45½	.68½	.49½	.73½
tks, frt allowed, drs gal. p	.41	.44½	.41	.48	.44	.52½
Synthetic, frt allowed, east of Rocky M., drs gal. p	.52½	.59½	.52½	.60	.57½	.60
tks, frt allowed....gal.	.48	.49½	.48	.53	...	.53
West of Rocky M., frt allowed, drs ....gal. p	.55½	.58	.55½	.69	.66	.69
tks, frt allowed ..gal. p	...	.51	.51	.63½	...	.63½
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Anthraquinone ....lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	...	.10½
Chloride, 90 lb cyl .....lb.	...	.45	...	.45	...	.45
Ethyl Ketone, tks ......lb.	...	.07½	...	.07½	...	.07½
Propyl carbinol, drs ....lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks ..lb.	35.00	...	35.00	...	35.00	...
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY ....gal.	...	.07¼	.07	.08¼	.07¾	.08¼
Monoamylamine, drs, wks lb.	...	1.00	...	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.						
Monoethanolamine, tks, wks lb.	...	.30	...	.30	...	...
Monomethylparaminosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls..lb.	...	.04¼	...	.04¼	...	.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs ....ton	...	24.00	22.75	24.00	23.50	27.00
J2 bgs ....ton	...	15.00	14.50	15.00	15.00	15.75
R2 bgs ....ton	...	14.50	14.00	14.50	16.00	16.50
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ....gal.	...	.31	...	.31	.26	.30
drs, c-l ....gal.	...	.36	...	.36	.31	.35
Naphthalene, dom, crude, bgs, wks ....lb.	...	2.75	2.75	4.50	1.65	3.00
Imported, cif, bgs ....lb.	...	nom.	...	...	1.90	3.00
Dyestuffs, bgs, bbls, Eastern wks ....lb.	.06	.07	.06	.07	.04¼	.07
Balls, flakes, pks ......lb.	...	.08	.07¼	.08	...	...
Balls, ref'd, bbls, Eastern wks ....lb.	...	.07¼	.06¾	.07¼	.04½	.06¾
Flakes, ref'd, bbls, Eastern wks ....lb.	...	.07¼	.06¾	.07¼	.04½	.06¾
Dyestuffs, bgs, bbls, Mid-West wks ....lb. q	.06½	.07½	.06½	.07½	.04¾	.07½
Balls, ref'd, bbls, Mid-West wks ....lb. q	...	.07¾	.07¼	.07¾	.05	.07½
Flakes, ref'd, bbls, Mid-West wks ....lb. q	...	.07¾	.07¼	.07¾	.05	.07¼
Nickel Carbonate, bbls....lb.	...	.36	...	.36	.35	.36
Chloride, bbls ....lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY..lb	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY ...lb.	.13	.13½	.13	.13½	.12½	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.11½	.13½
Metal ingot ....lb.	...	.35	...	.35	...	.35
Nicotine, free 50%, 8 lb tins, cases ....lb.	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs ......lb.	.75	1.17	.75	1.17	.67	.80
Nitre Cake, blk ....ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks ....lb.	.09	.11	.09	.11	.09	.11
tks ....lb.	...	.08½	...	.08½	...	.08½
Nitrocellulose, c-l-l c-l, wks lb.	.26	.29	.26	.34	.27	.34
Nitrogenous Mat'l, bgs, imp unit	...	2.75	2.00	2.85	2.20	2.75
dom, Eastern wks ....unit	...	2.85	1.90	2.85	2.20	2.40
dom, Western wks ....unit	...	2.65	1.85	2.10	1.90	2.30
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs .....lb.	.16	.18	.16	.18	.12	.18
Chinese, bgs ....lb.	.19	.20	.19	.20	.19	.20
Oak Bark Extract, 25%, bbls lb.	...	.03½	...	.03½	...	.03½
tks ....lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks ...lb.	...	.15	...	.15	...	...
Orange-Mineral, 1100 lb cks NY ....lb.	...	.10¾	.10	.10¾	.09¼	.10½
Orthoaminophenol, 50 lb kgs.lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.82	.84	.82	.84	.82	.84
Orthochlorophenol, drs ....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs ....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb drs ....lb.	.06½	.11½	.05½	.11½	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; p Country is divided into 5 zones. Also see footnote directly above; q Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Orthonitrochlorobenzene, 1200 lb drs, wks . . . lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks . . . lb.	.07	.10	.07	.10	.05½	.10
Orthonitrophenol, 350 lb drs . . . lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l . . . lb.	.14½	.15	.14½	.15	.14½	.15
Orthonitroparachlorphenol, tins . . . lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst . . . lb.	.17	.25	.17	.25	.17	.25
51 deg liquid . . . lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs . . . lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, rfd, 200 lb cs slabs						
122-127 deg M P . . . lb.	.0445	.04½	.0445	.04½	.04	.04¾
128-132 deg M P . . . lb.	.04¾	.049	.04¾	.049	.05	.0515
133-137 deg M P . . . lb.	.05½	.05¾	.05½	.05¾	.0575	.06
Para aldehyde, 110-55 gal drs . . . lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs . . . lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs . . . lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs . . . lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs . . lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr . . . gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 200 lb bbls wks . . . lb.	.16	.20	.16	.20	.16	.20
Formaldehyde, bbls, wks lb.	.38	.39	.38	.39	.38	.39
Nitroacetanilid, 300 lb bbls . . . lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks . . . lb.	.47	.51	.47	.51	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks . . . lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls . . . lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls . . . lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.36	.37	.36	.37	.35	.37
Phenylenedamine, 350 lb bbls . . . lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs, c-l . . . lb.	...	.26	.26	.50	.32	.50
Toluenesulfonamide, 175 lb bbls . . . lb.	.70	.75	.70	.75	.70	.75
tks, wks . . . lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks . . . lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks . . . lb.	.58	.60	.58	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kgs . . . lb.	...	.24	...	.24	...	.24
250 lb kgs . . . lb.	...	.22	...	.22	...	.22
Perchlorethylene, 100 lb drs, frt allowed . . . lb.	...	.10½	.10½	.15	...	.15
Persian Berry Ext, bbls . . lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C,						
group 3, tks . . . gal.	...	.09	...	.09	...	.09
drs, group 3 . . . gal.	.10	.15	.10	.15	.10	.15
Petrolatum, dark amber, bbls . . . lb.	.02⅝	.02⅞	.02⅝	.02⅞	.02	.02⅞
Light, bbls . . . lb.	.03⅛	.03⅜	.03⅛	.03⅜	.02½	.03⅜
Medium, bbls . . . lb.	.02⅞	.03⅛	.02⅞	.03⅛	.02¼	.03⅛
Dark green, bbls . . . lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
White, lily, bbls . . . lb.	.06	.06¼	.06	.06¼	.05¼	.06½
White, snow, bbls . . . lb.	.07	.07¼	.07	.07¼	.06¼	.07½
Red, bbls . . . lb.	.02⅝	.02⅛	.02⅝	.02⅛	.02¼	.02⅞
Petroleum Ether, 30-60°,						
group 3, tks . . . gal.	...	.13	...	.13	...	.13
drs, group 3 . . . gal.	.15	.16	.15	.16	.15	.16

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Cleaners naphthas, group 3, tks, wks . . . gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Bayonne, tks, wks . . gal.	...	.09½	.09	.09½	...	.09
West Coast, tks . . . gal.	...	.15	...	.15	...	.15
Hydrogenated, naphthas, frt allowed East, tks . . . gal.	...	.16	.15	.16	.15	.17½
No. 2, tks . . . gal.	...	.18	...	.18	.18	.22½
No. 3, tks . . . gal.	...	.15	...	.15	.15	.17½
No. 4, tks . . . gal.	...	.18	...	.18	.18	.22½
Lacquer diluents, tks						
Bayonne . . . gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks . . . gal.	.07⅞	.08½	.07⅞	.08½	.07⅞	.08
Naphtha, V.M.P., East, tks, wks . . . gal.	...	.10	.09	.10	...	.09
Group 3, tks, wks . . . gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Petroleum thinner, East, tks, wks . . . gal.	...	.09	.09	.09½	...	.09
Group 3, tks, wks . . gal.	.06⅜	.06⅝	.06⅜	.06⅝	.05⅞	.06¼
Rubber Solvents, stand grd, East, tks, wks . . . gal.	...	.09½	.09	.09½	...	.09
Group 3, tks, wks . . gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Stoddard Solvent, East, tks, wks . . . gal.	...	.09½	.09	.09½	...	.09
Group 3, tks, wks . . . gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Phenol, 250-100 lb drs . . . lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs . . . lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs . . . lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride . . . lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins . . lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins . . . lb.	20.00	22.00	20.00	22.00	20.00	22.00

Current

Phosphate Rock
Rosin Oil

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ton	...	1.85	...	1.85	1.85	3.40
70% basis .. ..ton	...	2.35	...	2.35	2.35	3.90
72% basis ....ton	...	2.85	...	2.85	2.85	4.40
75-74% basis ....ton	...	3.85	...	3.85	3.85	5.40
75% basis ....ton	...	4.35	...	4.35	4.35	5.50
Tennessee, 72% basis ..ton	...	4.50	...	4.50	4.50	4.75
Phosphorous Oxychloride 175						
lb cyl .. ..lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ......lb.	.40	.44	.40	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb						
drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.44	.46	.44	.46	.44	.50
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks ....gal.	...	.59	...	.59	...	.59
Straw color, bbls ......gal.	...	.59	...	.59	...	.59
tks ....gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks ....ton	...	15.00	...	15.00	15.00	20.00
Burgundy, dom, bbls, wks lb.	...	.03½	...	.03½	...	.03½
Imported ....lb.	.11	.13	.11	.13	.11	.13
Coaltar, bbls, wks .....ton	...	19.00	...	19.00	...	19.00
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	4.00	4.50	4.00	4.50	3.75	4.25
Stearin, drs ....lb.	.03	.04½	.03	.04½	.03	.04½
Platinum, refd ....oz.	45.00	48.00	34.50	64.00	35.00	38.00

POTASH

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.07⅜
Liquid, tks ....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, imported						
20% basis, blk ....ton	...	12.00	11.00	12.00	8.60	11.00
30% basis, blk ....ton	...	16.50	14.40	16.50	12.90	14.40
Potassium Acetate ....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis						
bgs ....ton	...	25.00	22.50	25.00	22.00	22.50
Dom, blk ....unit	...	.50	.45	.50	.40	.45
Pot & Mag Sulfate, 48% basis						
bgs ....ton	...	24.75	22.25	24.75	19.50	22.50
Potassium Sulfate, 90% basis						
bgs ....ton	...	36.25	33.75	36.25	33.75	35.00
Potassium Bicarbonate, USP						
320 lb bbls ....lb.	.09	.18	.09	.18	.07½	.09
Bichromate Crystals, 725 lb						
cks ....lb.	.08½	.09	.08½	.09	.08⅛	.09
Binoxalate, 300 lb bbls..lb.	...	.23	...	.23	.22	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.35	.36
Carbonate, 80-85% calc 800						
lb cks ....lb.	.07¼	.07½	.07¼	.07½	.07½	.07⅞
liquid, tks ....lb.	...	.02⅞	...	.02⅞	...	...
drs, wks ....lb.	.03⅛	.03¼	.03⅛	.03¼	...	...
Chlorate crys, 112 lb kgs,						
wks ....lb.	.09¼	.09½	.09¼	.09½	...	.09¾
gran, kgs ....lb.	.12	.13	.12	.13	.12	.13
powd, kgs ....lb.	.08	.08¼	.08	.08¼	.08¾	.09¾
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.57½
Iodide, 75 lb bbls ......lb.	1.10	1.15	1.10	1.25	1.25	1.40
Metabisulfite, 300 lb bbls lb.	...	.15	.13¾	.15	...	.15
Oxalate, bbls ... .lb.	.25	.26	.25	.26	.16	.24
Perchlorate, cks, wks ...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys,						
500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18¼	.19½
Prussiate, red, 112 lb kgs lb.	.35	.38½	.35	.38½	.35	.38½
Yellow, 500 lb casks.. lb.	.18	.19	.18	.19	.18	.19
Tartrate Neut, 100 lb kgs lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb						
bbls ....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks ....lb.	.03	.04⅜	.03	.04⅜	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls ....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs ......lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs .....100 lb.	...	3.00	2.75	3.00	...	2.75
Linseed Oil, kgs ...100 lb.	...	4.75	4.50	4.75	...	4.50
Pyrethrum, conc liq:						
2.4% pyretherins, drs, frt						
allowed ....gal.	4.25	4.60	...	...	...	...
3.6% pyretherins, drs, frt						
allowed ....gal.	6.25	6.00	...	...	...	...
Flowers, coarse, Japan,						
bgs ....lb.	...	.11½	...	...	...	...
Fine powd, bbls......lb.	...	.14	...	...	...	...
Pyridine, 50 gal drs .....gal.	...	1.30	...	1.30	1.20	1.30
Pyrites, Spanish cif Atlantic						
ports, blk ... .unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.75	2.15	2.75	2.40	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅞	.02⅝	.02⅞	...	.02⅝
450 lb bbls, c-l ....lb.	...	.03¾	.03⅛	.03¾	...	.03⅛
Solid, 63%, 100 lb bales						
cif ....lb.	...	.03⅞	.03⅝	.03⅞	...	.03⅝
Clarified, 64%, bales..lb.	...	.04⅜	.03⅞	.04⅜	...	.03⅞
Quercitron, 51 deg liq, 450 lb						
bbls .. ..lb.	.06	.06½	.06	.06½	.06	.06½
Solid, 100 lb boxes .....lb.	.10	.12	.10	.12	.10	.12
R Salt, 250 lb bbls, wks ..lb.	.52	.57	.52	.57	.44	.45
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst ......lb.	.14	.14½	.14	.14½	.14	.15
Powd, bbls ....lb.	.13	.13½	.13	.13½	.13	.13½
Rosin Oil, bbls, first run gal.	.50	.52	.38	.52	.36	.45
Second run ....gal.	.53	.55	.43	.55	.43	.48
Third run, drs ....gal.	.60	.62	.49	.62	.50	.60

Prices

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	7.50	4.45	7.50	4.65	5.65
D	...	7.65	4.95	7.65	5.02½	5.75
E	...	7.65	5.15	7.65	5.15	5.90
F	...	7.65	5.40	7.65	5.20	5.95
G	...	7.65	5.50	7.65	5.25	6.00
H	...	7.65	5.60	7.65	5.25	6.00
I	...	7.65	5.70	7.65	5.25	6.00
K	...	7.65	5.55	7.65	5.27½	6.05
M	...	7.65	5.60	7.65	5.35	6.10
N	...	7.65	5.70	7.65	5.75	6.40
WG	...	7.65	5.85	7.70	5.95	6.87½
WW	...	8.15	5.90	8.45	6.25	7.55
Rosins, Gum, Savannah (280 lb unit):						
B	...	6.25	3.15	6.25	3.40	4.40
D	...	6.40	3.75	6.40	3.70	4.50
E	...	6.40	3.90	6.40	3.90	4.65
F	...	6.40	4.10	6.40	3.95	4.70
G	...	6.40	4.20	6.40	4.00	4.75
H	...	6.40	4.30	6.40	4.00	4.75
I	...	6.40	4.30	6.40	4.00	4.75
K	...	6.40	4.35	6.40	4.02½	4.80
M	...	6.40	4.35	6.40	4.10	4.85
N	...	6.40	4.45	6.40	4.50	5.15
WG	...	6.40	4.45	6.45	4.70	5.60
WW	...	7.20	4.55	7.20	5.15	6.25
X	...	7.20	4.55	7.20	5.20	6.25
Rosins, Wood, wks (280 lb unit), wks, FF	...	...	6.25	6.25	4.05	6.35
I	...	...	6.40	6.40	4.30	7.00
M	...	...	6.60	6.60	4.55	7.25
N	...	...	7.20	7.20	5.00	7.75
Rosin, Wood. c-l, FF grade, NY	...	6.87	6.10	7.35	4.92	5.62
Rotten Stone, bgs mines..ton	...	35.00	...	35.00	23.50	35.00
Lump, imported, bbls ...lb.	.05	.07	.05	.07	.05	.07
Selected, bbls. ....lb.	.08	.10	.08	.10	.08	.10
Powdered, bbls ....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Sal Soda, bbls, wks ...100 lb.	...	1.15	1.15	1.30	...	1.30
Salt Cake, 94-96%, c-l, wks ton	19.00	23.00	19.00	23.00	13.00	18.00
Chrome, c-l, wks ......ton	12.00	13.00	11.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls ......lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls ....lb.	.069	.07⅞	.069	.07⅞	.069	.07⅞
Cryst, bbls ....lb.	.069	.08	.069	.08	.069	.08
Satin, White, 550 lb bbls..lb.	...	.01½	...	.01½	...	.01½
Shellac, Bone dry, bbls..lb. r	.17½	.18	.17½	.26½	.19	.32
Garnet, bgs ....lb.	.16	.17	.16	.20	.17	.27
Superfine, bgs ....lb. s	.14½	.16	.14½	.18	.16	.28
T. N., bgs ....lb. s	.13½	.14	.13½	.16	.13	.25
Schaeffer's Salt, kgs .....lb.	.48	.50	.48	.50	.48	.50
Silver Nitrate, vials .....oz.	...	.32⅝	.32 5/16	.32⅝	.36⅜	.53¾
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.23
blk ....100 lb.	...	1.05	...	1.05	...	1.05
paper bgs ....100 lb.	...	1.20	...	1.20	...	1.20
bbls ....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs ....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	...	.08
Acetate, tech, 450 lb bbls, wks ....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs ....lb.	...	.64	...	.64	...	.64
Antimoniate, bbls ......lb.	.12	.12½	.12	.14	...	...
Arsenate, drs ....lb.	...	.10½	...	.10½	...	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs ....lb.	.46	.48	.46	.48	.46	.48
Bicarb, 400 lb bbl, wks 100 lb.	...	1.75	1.75	1.85	...	1.85
Bichromate, 500 lb cks, wks lb.	.06½	.07	.06½	.07	.06⅛	.07
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03¼	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	1.95	2.10
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech ....ton	13.60	16.50	13.60	16.50	13.60	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks ....lb.	.07½	.08¼	.07¼	.08¼	.07¼	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.17	.18	.17	.19	.18	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.50	3.00
Tech, reg cryst, 375 lb bbls, wks ......100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide ....lb.	1.90	1.95	1.90	2.05	2.00	2.40
Metal, drs, 280 lbs .....lb.	...	.19	...	...	...	...
Metanilate, 150 lb bbls..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ....100 lb.	...	2.15	2.15	3.00	2.65	3.05
cryst, bbls, c-l, wks 100 lb.	...	2.75	2.75	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.023	...	.023	...	.02½
Napthenate, drs ....lb.	...	.09	...	.09	...	.09
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ....ton	...	26.80	24.80	26.80	...	24.80
100 lb bgs ....ton	...	27.50	25.50	27.50	...	25.50
Bulk ....ton	...	25.50	23.50	25.50	...	23.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

Current

Sodium Nitrite
Terpineol

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Sodium (continued):						
Nitrite, 500 lb bbls .....lb.	.0710	.08	.0710	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks..lb.	.25	.27	.25	.27	.25	.27
Perborate, drs, 400 lbs..lb.	.17	.18	.17	.18	.17	.19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	1.95	1.95	2.30	2.20	2.30
bgs, wks ....100 lb.	...	1.75	1.75	2.10	2.00	2.10
tri-sodium, tech, 325 lb bbls, wks ....100 lb.	...	1.95	1.95	2.30	2.30	2.70
bgs, wks ....100 lb.	...	1.75	1.75	2.10	2.10	2.60
Picramate, 160 lb kgs ..lb.	.67	.69	.67	.69	.67	.69
Prussiate, Yellow, 350 lb bbl, wks ....lb.	.10	.11½	.10	.12	.11½	.12
Pyrophosphate, anhyd, 100 lb bbls ....lb.	...	.10	.10	.132	.102	.15
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.06½	.07	.05¼	.07¼	.04¼	.05
Stannate, 100 lb drs ....lb.	...	.34	.28½	.34	.31	.38
Stearate, bbls ....lb.	.20	nom.	.20	.26	.20	.25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l, wks ....100 lb. ‡	1.30	1.55	1.30	1.55	1.25	2.35
Sulfide, 80% cryst, 440 lb bbls, wks ....lb.	...	.02¼	...	.02¼	...	.02¼
62% solid, 650 lb drs, c-l, wks ....lb.	...	.03	...	.03	...	.03
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.02½	.023	.02½	.023	.02½
Sulfocyanide, bbls ......lb.	.28	.47	.28	.47	.32	.42½
Sulforicinoleate, bbls ...lb.	...	.12	...	...	...	...
Tungstate, tech, crys, kgs lb.	.85	.90	.85	.90	...	.90
Sorbitol, com., drs, basis content, wks ....lb.	...	.25	...	...	...	...
Spruce Extract, ord, tks...lb.	...	.01	...	.01	...	.01
Ordinary, bbls ....lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks....lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, bbls...lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	3.80	4.00	2.99	4.30	3.13	3.78
Powd, 140 lb bgs....100 lb.	3.40	4.10	3.09	4.54	3.23	3.66
Potato, 200 lb bgs......lb.	.04½	.05½	.04½	.05½	.04½	.06
Imp, bgs ....lb.	.05	.06	.05	.06	.05¾	.06½
Rice, 200 lb bbls ....lb.	...	.07¼	...	.07¼	.07¼	.08½
Wheat, thick, bgs ......lb.	.08¼	.08½	.08¼	.08½	...	.08¼
Strontium carbonate, 600 lb bbls, wks ....lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY lb.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Sucrose octa-acetate, den, grd, bbls, wks ....lb.	.45	...	.45	...	...	...
tech, bbls, wks ....lb.	.40	...	.40	...	...	...
Sulfur	...	...	...	...	...	...
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Superfine, bgs ......100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, red, 700 lb drs, wks ....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl lb.	.06½	.08½	.06½	.08½	.08½	.10
Multiple units, wks ....lb.	.05½	.06	.05½	.06	...	.06½
tks, wks ....lb.	.04½	.04¾	.04½	.04¾	...	.04¾
Refrigeration, cyl, wks ...lb.	.10	.13	.10	.13	...	.13
Multiple units, wks .....lb.	.07	.09¼	.07	.09¼	...	.09¼
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ......ton	...	54.00	52.00	60.00	50.00	65.00
Extract, 42°, bbls ......lb.	.04½	.16½	...	...	...	...
Superphosphate, 16% bulk, wks ....ton	...	8.00	8.00	8.25	8.25	8.50
Run of pile ....ton	...	7.50	7.50	7.75	7.75	8.00
Talc, Crude, 100 lb bgs, NY ....ton	14.00	15.00	14.00	15.00	14.00	15.00
Refd, 100 lb bgs, NY ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bgs, NY ton	23.00	30.00	22.00	30.00	22.00	30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	60.00	62.00	60.00	75.00	70.00	75.00
Refd, white, bgs, NY ton	65.00	70.00	65.00	80.00	75.00	80.00
Tankage Grd, NY ....unit u	...	3.75	2.65	4.00	2.35	3.00
Ungrd ....unit u	...	3.75	2.40	3.75	2.15	2.50
Fert grade, f.o.b. Chicago ....unit u	...	3.50	2.40	3.50	2.25	2.65
South American cif..unit u	...	3.75	2.70	3.75	2.45	3.15
Tapioca Flour, high grade, bgs ....lb.	.03½	.05½	.03½	.05½	.0215	.05
Tar Acid Oil, 15%, drs ..gal.	.22½	.23½	.22½	.23½	.21	.23½
25%, drs ....gal.	.24½	.26½	.24½	.26½	.23	.26½
Tar, pine, delv, drs .....gal.	...	.26	.25	.26	.25	.26
tks, delv ....gal.	...	.20	...	.20	...	.20
Tartar Emetic, tech ......lb.	.24¾	.25	.24¾	.25	.22¾	.25
USP, bbls ....lb.	.28	.28½	.28	.28½	.28	.28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	.13¾	.14¾
tks ....lb.	.13	.14	.13	.14	.13	.14

‡ Bags 15c lower; u + 10.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08½	.09
Tetrachloroethylene, drs, tech ....lb.	.10	.10½	...	...	...	...
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl..lb.	.20	.25	.20	.25	.20	.25
Tin, crystals, 500 lb bbls, wks lb.	.35½	.36	.35	.37½	.36	.39½
Metal, NY ....lb.	...	.46⅛	.40½	.48⅞	.456	.52½
Oxide, 300 lb bbls, wks lb.	.49	.51	.47	.53	.51	.58
Tetrachloride, 100 lb drs, wks ....lb.	.16¼	.23¾	.21¼	.24¾	.24¾	.26¾
Titanium Dioxide, 300 lb bbls lb.	.16	.19	.16¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ..lb.	.05¾	.06	.05¾	.06½	.06¼	.06½
Calcium Pigment, bbls ..lb.	.05¾	.06	.05¾	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks ....lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.80
Para, red, bbls ....lb.	...	.75	...	.75	...	.75
Toluidine, bgs ....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamylamine, drs, wks ..lb.	...	1.25	...	1.25	...	1.25
Triamyl Borate, lcl, drs, wks lb.	...	.27	...	...	...	...
Trichlorethylene, 600 lb drs, frt allowed E. Rocky Mts lb.	.089	.094	.089	.094	.09½	.10
Triethanolamine, 50 gal drs wks ....lb.	.26	.30	.26	.30	.26	.38
tks, wks ....lb.	...	.25	...	.25	...	...
Tricresyl Phosphate, drs ..lb.	.23	.26	.19	.26	.21	.23
Triphenyl Guanidine ....lb	58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ton	27.50	30.00	27.50	30.00	27.50	30.00
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	15.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.41½	.40½	.50	.43¾	.55½
Savannah, bbls ....gal.	...	.36½	.35½	.45	.38¾	.50¼
Jacksonville, bbls ....gal.	...	.36½	.35¼	.44½	.38¾	50¼
Wood Steam dist, bbls, c-l, NY ....gal.	...	.39	.38	.47	.43	.50
Urea, pure, 112 lb cases ..lb.	.14½	.15½	.14½	.17	.15½	.17
Fert grade, bgs. c.i.f. ..ton c.i.f. S.A. points ....ton	95.00	110.00	95.00	110.00	100 00	120.00
Urea, dom, f.o.b., wks....ton	95.00	110.00	95.00	110.00	..	..
Urea Ammonia liq 55% NH_3, tks ....unit	No prices			.96	..	.96
Valonia beard, 42%, tannin bgs ....ton	...	46.00	46.00	64.50	40.00	58.00
Cups, 32% tannin, bgs..ton	...	42.00	35.00	42.00	26.00	49 00
Mixture, bark, bgs ....ton	...	Nom.	...	Nom.	...	32.00
Vanilin, ex eugenol, 100 lb tins ....lb.	...	3.75	..	3.75	...	...
Ex-guaiacol ....lb.	...	3.65	.	3.65	...	...
Vermillion, English, kgs ..lb.	1.75	1.85	1.52	1.85	1.48	1.71
Vinyl Chloride, 16 lb cyl ..lb.	...	1.00	...	1.00	..	1.00
Wattle Bark, bgs ....ton	...	30.00	26.50	30.00	29.00	32.00
Extract, 60°, tks, bbls ..lb.	...	.03⅝	...	.03⅝	...	.03¾
WAXES						
Wax, Bayberry, bgs ....lb.	.17½	.20	17½	.20	.17½	.23
Bees, bleached, white 500 lb slabs, cases ....lb.	.36	.38	.34	.38	.33½	.34
Yellow, African, bgs..lb.	.25½	.26½	.24	.27	.21	.25½
Brazilian, bgs ....lb.	.27½	.28½	.25	.28½	.21½	.26½
Chilean, bgs ....lb	.27½	.28½	.25	.28½	.21½	.26½
Refined, 500 lb slabs, cases ....lb.	28	.30	.28	.30	.27½	.28
Candelilla, bgs ....lb	.16	.17½	.14	.17½	.10	.17½
Carnauba, No. 1, yellow, bgs ....lb.	.45	.46½	.43½	.48	.35	.54
No. 2, yellow, bgs ....lb.	.44	.45	.42	.46	.34	.51
No. 2, N. C., bgs ....lb.	.39½	.40	.39½	.40	.26½	.43½
No. 3, Chalky, bgs ...lb.	.34	.35½	.34	.38	.21	.42½
No. 3, N. C., bgs ....lb.	.34½	.35	.34	.41	.22½	.43
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	.43	.45
Yellow, bgs ....lb.	.36	.38	.36	.38	.36	.38
Domestic, bgs ....lb.	.08	.11	.08	.11	.08	.11
Japan, 224 lb cases ....lb.	.08½	.09	.08	.09	.06	.09
Montan, crude, bgs ....lb.	.10¾	.11¾	.10¾	.11¾	.10½	.11¾
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.23	.24	.22	.24	.19	.24
Cakes, cases ....lb.	.24	.25	.23	.25	.20	.25
Whiting, prec 200 lb bgs, c-l, wks .... ton	...	15.00	...	15.00	12.00	15.00
Alba, bgs, c-l, wks ....ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, wks ..ton	11.50	14.50	11.50	15.00	...	15.00
Wood Flour, c-l, bgs .... ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks ....gal.	...	.33	...	.33	.27	.33
Coml, tks, wks, frt allowed ....gal.	...	.30	...	.30	.26	.30
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY ....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride fused, 600 lb drs, wks ....lb.	.04½	.05¾	.04½	.05¾	.04½	.05¾
Gran, 500 lb bbls, wks ..lb.	.05	.05¾	.05	.05¾	.05	.05¾
Soln 50%, tks, wks..100 lb.	...	2.00	...	2.00	...	2.00
Cyanade, 100 lb drs ....lb.	.36	.37	.36	.38	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv ....lb.	...	.0685	.068	.0755	.057	.0685
Metal, high grade slabs, c-l, NY ....100 lb.	...	5.275	...	5.275	4.05	5.22½
E. St. Louis ....100 lb.	...	4.85	4.80	4.90	3.70	4.85
Oxide, Amer, bgs, wks..lb.	.05	.05½	.05	.05½	.05	.06¼
French, 300 lb bbls, wks lb.	.05½	.07	.05½	.07	.05½	.10⅞
Palmitate, bbls ....lb.	.22	.23	.22	.23	.21	.23
Perborate, 100 lb drs .. lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls lb.	.09	.10	.05¾	.10	.05¾	.06½
Stearate, 50 lb bbls ....lb.	.20	.23	.19	.23	.18	.22

Current

Zinc Sulfate
Oil, Whale

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Zinc Sulfate, crys, 400 lb bbl, wks ....lb.	.028	.033	.028	.033	.028	.033
Flake, bbls ....lb.	.032	.035	.032	.035	.032	.035
Sulfide, 500 lb bbls, delv lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.11¾
bgs, delv ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Sulfocarbolate, 100 lb kgs ....lb.	.24	.25	.24	.25	.24	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs ....lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs ......lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Castor, No. 3, 400 lb bbls..lb.	.10¼	.10¾	.10¼	.10¾	.09¾	.10¾
Blown, 400 lb bbls .....lb.	.12¼	.13	.12¼	.13	.11½	.16
China Wood, bbls spot NY lb.	.13¼	.13½	.13¼	.19¼	.094	.40
Tks, spot NY ....lb.	...	.128	.128	.19	.088	.35
Coast, tks ....lb.	...	.127	.127	.18	.087	.24
Coconut, edible, bbls NY..lb.	...	.12¼	.09¼	.12¼	.04	.12
Manila, tks, NY ....lb.	.06⅜	nom.	.04⅛	.06⅜	.03¾	.06¼
Tks, Pacific Coast ....lb.	.06⅛	nom.	.03⅞	.06⅛	.03⅜	.06
Cod, Newfoundland, 50 gal bbls ....gal.	...	.48½	.40	.48½	.34	.38
Copra, bgs, NY ....lb.	.0375	nom.	.0320	.0360	.02	.038
Corn, crude, tks, mills ....lb.	...	.08⅜	.08	.09¾	.08¾	.11
Refd, 375 lb bbls, NY ..lb.	.12¼	.12½	.10¾	.13	.11½	.14
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls, NY ....lb.	.05½	.06	.05¼	.06¾	.04½	.06
English, bbls, NY......lb.	.09	.09½	.08¾	.10¼	.04¾	.06½
Greases, Yellow ....lb.	...	.06¼	.03⅜	.06⅝	.05	.06¾
White, choice bbls, NY lb,	.06⅞	.08⅜	.04⅛	.08⅜	.05¼	.08½
Herring, Coast, tks ......gal.	...	.31	...	.31	.23	.33
Lard Oil, edible, prime ...lb.	...	.14¼	.12¾	.14½	.09¾	.20½
Extra, bbls ....lb.	...	.10¾	.09½	.11	.08½	.11¾
Extra, No. 1, bbls ......lb.	...	.09¾	.07¾	.09¾	.08¼	.11
Linseed, Raw, less than 5 bbl lots ....lb.	...	.102	.104	.102	.091	.1130
bbls, c-l, spot ....lb.	...	.094	.096	.094	.083	.102
Tks ....lb.	...	.088	.086	.097	.0770	.096
Menhaden, tks, Baltimore gal.	...	.30	.25	.36	.25	.36
Refined, alkali, drs .....lb.	...	.076	.066	.082	.061	.082
Tks ....lb.	...	.07	.062	.072	.055	.072
Light pressed, drs ......lb.	...	.07	.06	.076	.055	.076
Tks ....lb.	...	.064	.056	.066	.049	.066
Kettle bodied, drs .....lb.	...	.086	.08	.096	...	...
Neatsfoot, CT, 20° bbls, NY ....lb.	.16	.16¼	.16	.16¾	.16¼	.16¾
Extra, bbls, NY ....lb.	...	.10	.08	.09½	.08½	.11¼
Pure, bbls, NY ....lb.	...	.11½	.11½	.12¾	.11¾	.13¼
Oiticica, bbls ....lb.	...	.10	.10	.15½	.13½	.28
Oleo, No. 1, bbls, NY ....lb.	...	.11½	.09¼	.12½	.10¾	.14½
No. 2, bbls, NY ....lb.	...	.11	.08¾	.12	.10	.13¾
Olive, denat, bbls, NY ...gal.	...	1.15	.73	1.50	.82	.95
Edible, bbls, NY ......gal.	1.00	nom.	1.60	2.25	1.55	1.90
Foots, bbls, NY ....lb.	.09¼	.09⅜	.08	.09½	.07⅛	.10
Palm, Kernel, bulk ....lb.	...	.0545	.04¾	.0545	...	...
Niger, cks ....lb.	.04⅞	.05	.04	.05	.034	.05¾
Sumatra, tks ....lb.	...	.05⅜	.03¾	.05⅜	...	...
Peanut, crude, bbls, NY ..lb.	...	.09	.08	.09½	...	...
Tks, f.o.b. mill ....lb.	...	.08⅝	.07¾	.09¼	.08¾	.10¾
Refined, bbls, NY ......lb.	...	.12½	.12	.13¼	.12½	.14
Perilla, drs, NY ....lb.	.09½	.09¾	.07	.10	.07¼	.10¼
Tks, Coast ....lb.	.09	.09¼	.066	.09⅜	.068	.08½
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.11¼	.12	.086	.12	.07½	.09
Denatured, drs, NY ...gal.	.72	.75	.52	.68	.40	.56
Red, Distilled, bbls ....lb.	.10⅛	.11⅝	.08⅝	.11⅝	.07⅜	.10⅝
Tks ....lb.	...	.09¼	.07¾	.09¼	.06½	.08¾
Salmon, Coast, 8000 gal tks ....gal.	...	.32	.31	.32½	.25	.35
Sardine, Pac Coast, tks ..gal.	.36	nom.	.28	.39	.24½	.37½
Refined alkali, drs ......lb.	...	.076	.066	.082	.065	.082
Tks ....lb.	...	.07	.062	.072	.06	.072
Light pressed, drs ......lb.	...	.07	.06	.076	.055	.076
Tks ....lb.	...	.064	.056	.066	.049	.066
Sesame, yellow, dom .....lb.	...	.13	.12¾	.14½	.12¼	.15½
White, dos ....lb.	.13	nom.	.12¾	.14½	.12¾	.15½
Soy Bean, crude						
Dom, tks, f.o.b. mills ...lb.	...	.08⅝	.07	.087	.08	.10
Crude, drs, NY ......lb.	.091	.097	.076	.099	.086	.11
Refd, bbls, NY ....lb.	.096	.105	.081	.107	.091	.115
Tks ....lb.	.09	.095	.07½	.097	.08	.10½
Sperm, 38° CT, bleached, bbls NY ....lb.	.098	.10	.094	.101	.099	.101
45° CT, bleached, bbls, NY ....lb.	.091	.093	.087	.094	.092	.094
Stearic Acid, double pressed dist bgs ....lb.	.10½	.11	.08½	.11	.10	.12¼
Double pressed saponified bgs ....lb.	.10¾	.11¾	.09	.11¾	.09	.12¾
Triple pressed dist bgs..lb.	.13½	.14½	.11¼	.14½	.12¾	.15¼
Stearine, Oleo, bbls ......lb.	.09	.09½	.07¼	.10½	.09¼	.12½
Tallow City, extra loose ..lb.	.06⅞	.07	.04⅛	.07⅛	.05⅜	.07⅜
Edible, tierces ....lb.	...	.09	.06¾	.09¼	.07¼	.09¼
Acidless, tks, NY ......lb.	...	.09¼	.07	.09¼	.07½	.10¾
Turkey Red, single, bbls ..lb.	.08	.08½	.08	.08½	.07½	.08½
Double, bbls ....lb.	.12½	.13	.12½	.13½	.12½	.13½
Whale:						
Winter bleach, bbls, NY lb.	.0800	.082	.072	.082	.07	.083
Refined, nat, bbls, NY ..lb.	.073	.075	.068	.076	.064	.081

THE CHEMICAL MARKET-PLACE

Local Suppliers

A directory of responsible manufacturers' agents and jobbers maintaining spot stocks

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GEO. MANN & CO., INC.
251 Fox Pt. Blvd., Providence, R. I.
(Phone—Gaspee 8466)
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NORTH STATION INDUSTRIAL BLDG.
150 Causeway St., Boston, Mass.
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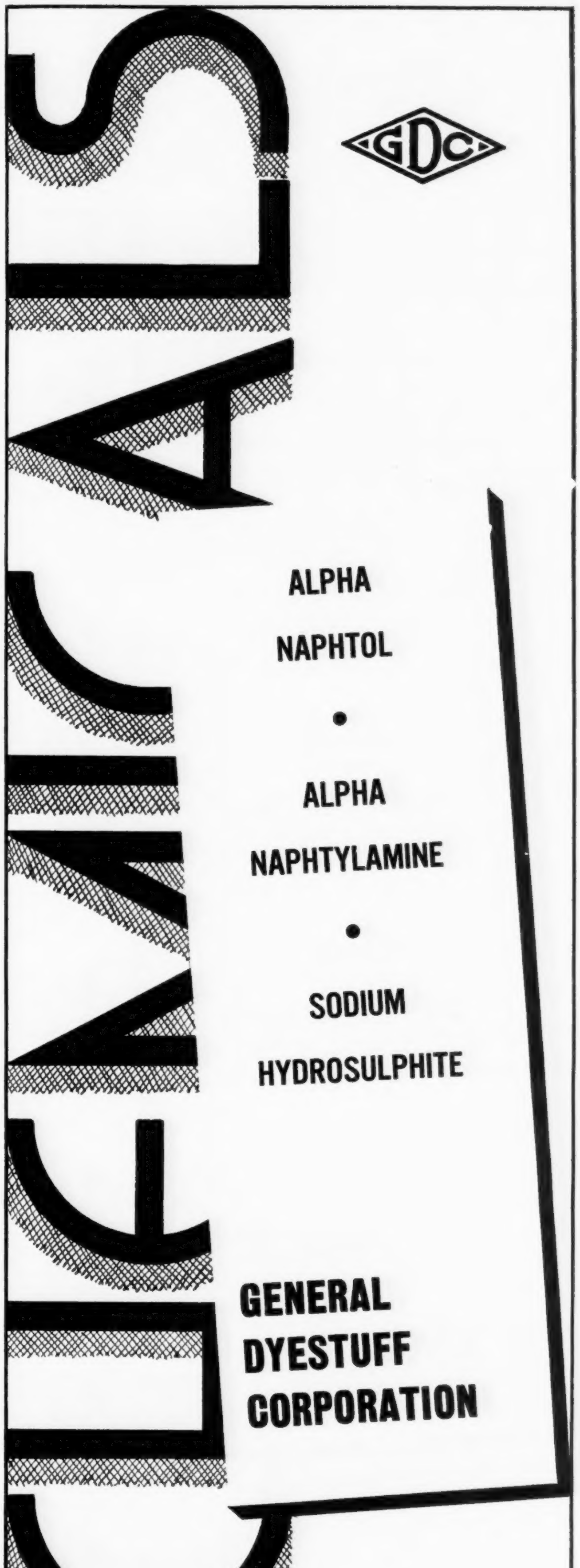


"We"—Editorially Speaking

Preparing copy for the new edition of The Chemical Who's Who—as we've been doing—has a seductive fascination. First, it is about 99.9 per cent. pure "human interest", and then some of our distinguished ones' handwriting demands all the qualities that made Sherlock Holmes famous plus the gifts that enable certain people to win cross-word puzzle prizes.

But the chief charm of this drab job lies in the replies to the question, "Hobbies". We've been collecting statistics as we go. Golf leads all. Gardening is second. A very sizable club might be formed entitled "The Chemical Philatelists". Music and reading about balance out hunting and fishing. These are all preliminary ratings (based only on the 3000 questionnaires now ready for the printer) but we promise complete returns when the book is published in January.

While these favorite hobby horses have the most riders, there are plenty of chaps who dash off on a broncho of their own. There's a well known vegetable oil man, for example, whose hobby is "biblical prophecies". Frank McDermott, of Du Pont, pursues *Lampyridae* (fireflies to you) and Francis J. Stokes, who makes chemical apparatus claims *Horology* (you're wrong again, it means clocks and watches and such like). We suspect that Sydney H. Hall indulges in sarcasm when he writes down Household Heating. His address is North Tonawanda, N. Y.

Continuing our researches into the hobbies of our distinguished ones (as revealed by their Chemical Who's Who questionnaires), we want to place on record the following rarities—pouter pigeons and Persian cats, plaster casts of wild animal footprints, visiting the sick and lonely, breeding fish, dachshunds and canaries, teaching English to adult foreigners, collecting lace.

Maybe they call them "Baby Bonds" because the baby will have to pay the taxes to redeem them.

It is always pleasant to have one's opinion confirmed—our own high one of *The Phoenix Flame,* house organ of the Phoenix Metal Cap Co., is brilliantly sealed by its selection for the third successive year as one of the Direct Mail Leaders of 1936.

A lively market for the above "new issue" of Chile ought to be created among the chemical philatelists—an idea here for Post Master Farley to vary his regular weekly commemorative issue with some pretty new stamps of industrial appeal.

Fifteen Years Ago

From our issues of November, 1921

Charles H. Herty resigns as editor *I. & E. C.* to devote full time to Synthetic Organic Chemical Manufacturers' Ass'n.

Hercules Powder announces absorption of all departments of Aetna Explosives.

Celluloid Co., Newark, N. J., awards contract for one story and basement building, estimated cost $200,000.

Ernest T. Trigg elected president National Paint, Oil & Varnish Ass'n.

International Nickel contracts with United Engineering & Foundry, Huntington, W. Va., for manufacture monel metal.

Chemical Salesmen's Ass'n organizes chapter in New York City; Ralph Dorland elected president.

Seek new uses to solve problem of coal-tar surplus.

A. W. Mellon, Secretary Treasury, and R. B. Mellon donate plot of land to U. of P. for erection of research laboratories.

Henry Wigglesworth, director development, General Chemical, resigns.

Merger of Seydel Mfg. Co., Jersey City, and Nitro Products Corp., Nitro, W. Va., announced by Herman Seydel.

Sundry manufacturers of carbon tetrachloride, perborate, SO_2, and T. S. P. ought to get a great kick out of an article entitled "The Consumer Sees Red" in the November *Mercury.* It's an exposé by Fletcher Pratt of the methods and purposes of the Consumers' Research and its imitators that should warm their hearts.

As a sample of the sublime level that propaganda reaches, Mr. Pratt quotes the following reply to an inquiring subscriber:

Question: My wife fails to experience orgasm. Is this dangerous?

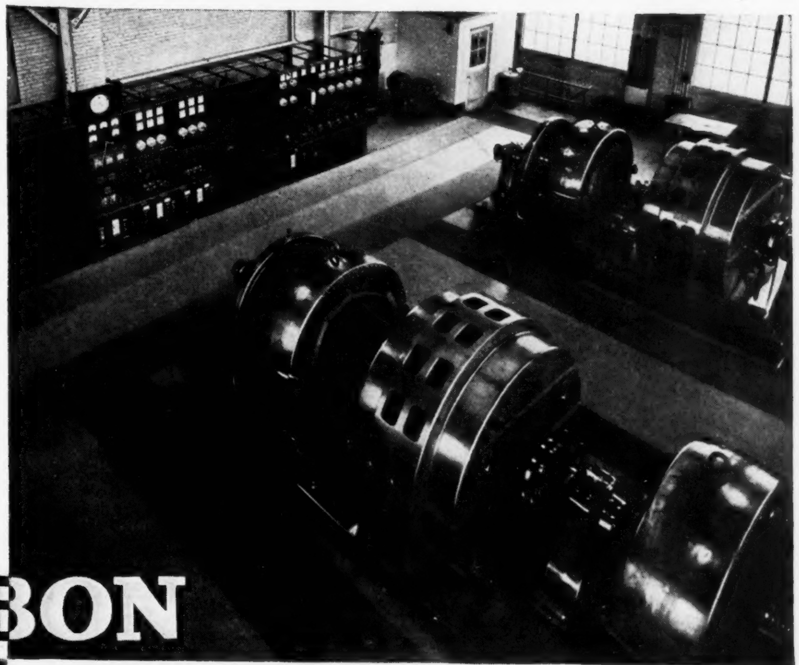
Answer: Under capitalism the sex life of woman is abnormal.

Which reminds us of a question that turned up in our own mail basket this morning. As an inquiring professor of chemistry writes: "What is the normal price of a natural material compared to the normal price of its synthetic substitute?" To which we shall certainly reply that in chemical industry there is no such thing as a normal price.

Sometimes a price gets "nominal"; but not very often in these times, and never "normal" no time.

If two negatives make a positive, why shouldn't two improbabilities make a possibility? Hence we see no reason to doubt the fact that Miss Besiljka Pantschev of Sofia, Bulgaria, (as reported in the tabloids) has not spoken for six months for love of one Milorad Kankulov, a poor but honest chemist.

Somebody in the industry should sue McIntyre—that chap who writes the New York chatter columns largely syndicated in the sticks—for writing about "the gangsters and their chemical chickadees". If The Chemical Foundation couldn't become excited about this slur on America's key industry—we mean chemicals, not rackets—why then R. & H. or Buffalo Electrochem ought to do something about it.



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